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**What in
This Area**

**Could Replace the Work of Competent
Veterinarians?**

To the rank and file and the uppermost council of the veterinary profession, producing farm animals to provide a stated quantity of essential commodities *per capita* on the basis of so many head *per annum* is subordinate to the mastery of infectious, parasitic, and nutritional diseases; in other words, subordinate to the work of formally educated Doctors of Veterinary Medicine.

Otherwise expressed, in the successful operation of the country's livestock and agricultural industry, there is no alternative for "health among the animals of the farm" — the task entrusted to veterinary science.

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A Clinical Study of Venezuelan Virus Equine Encephalomyelitis in Trinidad, B. W. I.

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Columbus, Ohio

FROM BOTH economic and public health viewpoints, epizootic encephalomyelitis is the most important equine disease now occurring in the United States. Thus far in North America, the recognition of a causative virus other than eastern or western has not been made. The clinical extent of the susceptibility of horses to the virus of St. Louis encephalitis of man is yet to be established, but neutralizing substances for it have been demonstrated in the serums of horses^{1, 2}.

In South America, a third primary equine neurotropic virus "Venezuelan" is recognized and has been separately studied in epizootic proportions in Colombia, Venezuela, and the adjacent British island, Trinidad.

HISTORICAL BACKGROUND

In 1938, Beck and Wyckoff³ isolated a virus from a horse brain received from Venezuela which possessed biologic properties distinctly different from eastern and western. In animal passages, they demonstrated strikingly high concentrations which, when titrated, remained infectious

for mice in dilutions of 10 to 7, indicating a virulence 10 to 100 times greater than that of eastern which habitually has a higher infective titer than western virus. Cross-immunity tests revealed that vaccine of eastern and western origin would not protect against Venezuelan virus, but vaccine from the latter protected against light eastern infection. The name "Venezuelan" has persisted for the new virus.

In Venezuela, the disease *peste loco* made its first appearance in 1936 on the Colombian border, where it is believed to have originated in 1935. Colombian investigators temporarily diagnosed it Borna disease. In 1936, Kubes⁴, in Venezuela, began an intensive study of the etiologic agent. In 1938, a panepizootic swept easterly across Venezuela and caused inestimable equine losses. In 1939, Kubes and Rios⁵ reported further on the immunologic singularity of Venezuelan virus in a comparative study with eastern and western virus and a virus from Argentina. The western was reported from Argentina⁶ in 1934 by Rosenbusch and the eastern in Panama⁷ in 1937 by Kelser. The present active strain in Brazil⁸ is reported as eastern by Carneriro and Cunha.

Following the work by Higbie and Howitt⁹, demonstrating that virus can be propagated in chicken embryos and the resultant vaccine developed by Beard, Finkelstein, Sealy, and Wyckoff¹⁰, a study of the behavior of Venezuelan virus on 11- to 14-day chick embryos was made by Kubes and

In October 1943 the author, while stationed in Trinidad was sent by the Army Medical Department to the Institute of Veterinary Research at Caracas, Venezuela, for orientation study in the disease. The director, Vladimir Kubes and the veterinary supervisor for the Minister of Agriculture, G. Rivas-Laralde provided an abundance of demonstrations in the behavior of the virus, vaccine production, and field control of the disease in Venezuela.

Passed for publication by the War Department Bureau of Public Relations.

Rios⁵. Their work led to the production of a similar vaccine.

Death of the embryo occurs at approximately eighteen hours under incubation, after allantoic inoculation. Embryo cultured Venezuelan virus has an average dilution endpoint of 10:7, and mouse-brain

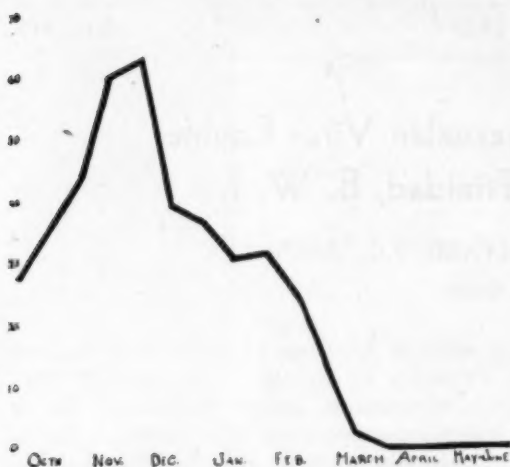


Fig. 1—Case incidence of equine encephalomyelitis in Trinidad as recorded by H. V. M. Metivier.

carried virus 10:6 to 10:8. Stock virus is maintained by multiple mouse-brain passages. A composite brain suspension from a series of mice is used to prepare embryo inoculum, and the virus concentration on the chick-tissue culture is then titrated by dilution and intracerebral mouse inoculations. The acceptable endpoint is 10 to 7.

After inactivation (formalin) and clarification, the antigenicity of the chick tissue is then challenged in a series of mouse-protection tests. The test mice receive 0.2 cc. of the vaccine, subcutaneously, every other day for four days, followed three days thereafter by the original mouse virus, intracerebrally, in six tenfold dilutions from 10:1 to 10:6. The challenging virus is simultaneously titrated in susceptible controls.

The acceptable degree of immunity in the vaccinated group must approach 1,000,000 m.l.d. in order to be considered satisfactory. A final step is a sterility test under incubation.

In 1939, production of Venezuelan chick-embryo vaccine was begun at the Institute

of Veterinary Research, Caracas, Venezuela. At the time of the Trinidad outbreak, it was my privilege to visit the Institute and to observe their methods. Venezuela is believed to be the first South American country to adopt the chick-embryo method of producing vaccine for the prevention of the disease. Prior to the work by Kubes, eastern and western vaccines of North American origin were inadvertently used in the field in Venezuela and were accordingly ineffective in the control of the disease.

The virus of Colombian equine encephalomyelitis was isolated in 1942 by Lleras and Figueroa¹¹ and in the same year Kubes¹² conducted a study of its immunologic relation to the virus of Venezuela. For practical purposes, they were identical except that vaccine prepared from the autogenous virus of Venezuela possessed greater antigenic power in mouse-protection tests than that prepared from a virus specimen received from Bogota, Colombia. This observation may not be a profound characteristic, but one acquired in the laboratory, whereas the material worked with from Colombia was implied to be of more recent equine origin.

Statistical data on vaccinal control of the disease in Venezuela are reported by G. Rivas Larralde¹³. Vaccination campaigns are staged in approximating geographic zones. The intradermic 1-cc. method is used and the treatment is repeated on the seventh to tenth day. The procedure is not varied with age or species. Government veterinarians are assigned to resident stations throughout the country and vaccination campaigns are repeated at intervals of six months during epizootic cycles. Cyclic, rather than endemic, behavior of the disease appears to be as characteristic of Venezuelan virus as it is of eastern and western.

In 1943, another panepizootic swept Venezuela; beginning in the western states, it progressed easterly as it did in 1938, and, simultaneously with the outbreak in Trinidad, it had reached the delta of the Orinoco River, then inundated, and the Venezuelan east coast on the Gulf of Paria. This gulf separates Trinidad from the South American continent. One half million horses were vaccinated in Venezuela during the period, January to October, 1943, and it is believed from the success of the program that a

substantial temporary immunity against natural infection is established with Venezuelan vaccine. Semiannual treatment rather than annual, as is the accepted method in the United States, is believed to be necessary by the Venezuelans.

Insect life is persistent and there has been no seasonal limitation to epizootics. The duration of immunity from Venezuelan vaccine has not been determined. It is believed that it is solid for at least six months and no doubt longer in animals "hypered" after vaccination by the bite of infected mosquitoes. In epizootic years in Venezuela, it is likewise considered advisable to treat semiannually in the interest of maintaining the present high protection rate of vaccination, and thus encourage confidence and education among many and varied classes of people upon whose cooperation the success of a vaccination campaign depends. Vaccinated animals are identified in Venezuela by painting a large V on the forehead and a smaller one inside the first at the time of the second injection. Traveling animals so marked aid in disseminating vaccination education among the peasantry.

The control of any communicable equine disease in Venezuela must be considered as a tremendous task. Horse breeding is a lively industry; in addition to branded ranch stock and individually owned animals, there are herds of hundreds of wild horses to contend with, and a complicating incidence of infectious equine anemia and trypanosomiasis (cripping plague).

THE TRINIDAD OUTBREAK

Trinidad is a British colonial island located off the east Venezuelan coast 10 degrees north of the equator. It is approximately 50 miles long and 32 miles wide. The present human population is estimated at 520,000 and the equine at 10,000. The climate is humid with daily temperature variations from 70 F. in the early morning to 90 F. and above at midday. The rainy season normally lasts from May to December.

The disease was first recognized in Trinidad,^{14, 15} Oct. 1, 1943, in what appeared to be an explosive onset involving twelve donkeys in the south of the island on the gulf shore. It is theorized that sporadic primary cases probably occurred a short time previously which served to in-

fect the subsequently incriminated prime vector, *Mansonia tittilans*,¹⁵ (culicine mosquito) whose flight range is largely restricted to its breeding areas. The necessary long range carrier from the continental epizootic is believed to have been *Aedes taeniorhynchus*¹⁵ (anopheline mosquito), which although not particularly equinophilic in feeding habits may well have infected an initial case which was subsequently fed upon by the abundant, persistent, horse-biting *M. tittilans*.

The outbreak in Trinidad ran its course confined to the area of the original focus, the Oropuche Lagoon, on the south west coast of the island. It is believed that this fortunate restriction was the direct result of a prompt vaccination campaign launched with the idea of creating a zone of vaccinated animals surrounding the area, thus serving to "play out" infected vectors on immune hosts. The campaign was subsequently elaborated upon to include the entire colony. The only vaccine employed was the product produced by the Institute of Veterinary Research, Caracas, Venezuela. Six thousand animals were treated during the period Oct. 26, 1943 to March 1, 1944. Figure 1 illustrates the corresponding disease occurrences.

Numerical Summary of Trinidad Outbreak (Official report by H. V. M. Metivier)

Total number of cases	377
Total deaths	314
Total recoveries	63
Mortality	83.29%
Mortality by species:	
Donkeys	91.49%
Horses	78.52%
Mules	59.67%

CLINICAL NOTES

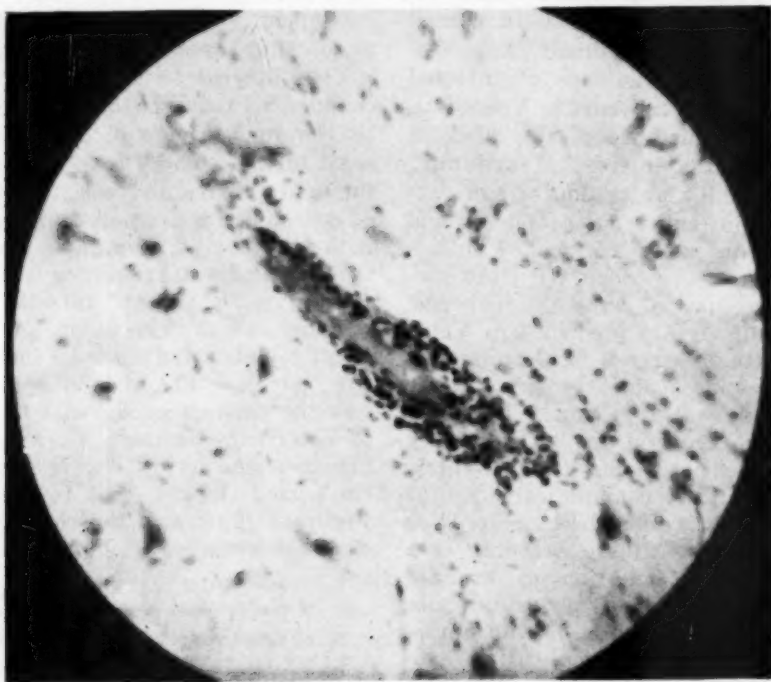
The paramount damage produced by Venezuelan virus is to the brain and spinal cord; but virus persists in the blood stream well into the terminal stages of the disease, which is not true with eastern and western viruses. This determination was made by blood inoculation of guinea pigs in the field. The cases used were selected simultaneously as bait for stable type mosquito traps employed for the collection of naturally infected mosquitoes¹⁶. It was then known in advance if the mosquitoes subsequently captured had fed upon an animal with blood circulating virus. Diagnosis in the guinea pigs was accomplished by employing their brain substances as the inoculum in cross-immunity tests with Venezuelan immune and susceptible guinea pigs. Blood virus in

advanced cases was also demonstrated in material forwarded to the U. S. Army Medical School¹⁶. In one advanced case, a specimen of aqueous humor was collected by orbital puncture, and with it guinea pigs were successfully infected. No duplication of this experiment was attempted. The animal involved showed marked photophobia and lachrymation.

The gross appearance of the brain is one of congestion; the meninges are injected and a blood stasis outlines the convolutions. Petechiae are seen in both the grey and white

panied by loss of appetite and depression. The febrile period generally lasts about forty-eight hours, at which time early neurologic symptoms begin. The fever curve is then downward and is frequently normal during severe brain manifestations and subnormal at the time of death.

Variations are seen in early brain symptoms which reflect the region of the brain primarily damaged. Consciousness is always deranged, manifested by somnolence, reflex excitability from cerebral irritation, or incoördination. Somnolence is predominate in donkeys and the



—Photo by Lieut. Stanley F. Yolles

Fig. 2—Cerebral cortex (mule) showing perivascular infiltration.

matter. Histopathologically, there is generally found a perivascular infiltration (cuffing) as well as diffuse infiltration with polynuclear leucocytes. Inflammatory cells are seen about and inside of the ganglion cells and occasionally there are foci of necrosis.

Perivascular cuffing is pathognomonic of encephalitis, but does not afford identification of the offending virus. In Borna disease (Germany) characteristic intracellular inclusion bodies appear, but such a distinguishing feature is not present in eastern, western, or Venezuelan types of horse encephalitis. Their differentiation must be accomplished, biologically, by such procedure as cross-immunity tests or serologic reactions in the form of neutralizing and complement-fixing antibodies.

The period of incubation in a donkey yearling, as demonstrated by transmission with naturally infected mosquitoes¹⁶, was forty-eight hours and a fatal course of the disease, six days. The onset is evidenced by temperature elevations of 2 to 5 degrees (103 to 105 F.) accom-

panied by loss of appetite and depression. The febrile period generally lasts about forty-eight hours, at which time early neurologic symptoms begin. The fever curve is then downward and is frequently normal during severe brain manifestations and subnormal at the time of death. Variations are seen in early brain symptoms which reflect the region of the brain primarily damaged. Consciousness is always deranged, manifested by somnolence, reflex excitability from cerebral irritation, or incoördination. Somnolence is predominate in donkeys and the cerebral form seen only in horses and mules. Incoördination is frequently the earliest brain symptom (drifting gait). Cerebral forms of the disease are indeed horrible. A prostrated animal will trot or gallop continuously, have masticatory spasms, and sometimes rise and madly lunge with a blind uncontrollable violence; others will circle constantly. Such violent cases, if uninterrupted by adequate restraint and sedatives, are persistent until collapse and death; frequently, in a lung, hemorrhage is apparently provoked by over-exertion without the control of normal responses to fatigue. In somnolence, the constant pendulancy of the head induces a passive congestion of the soft tissues resembling "big head" in purpura, but lacking the respiratory stenosis or hemorrhages seen in the latter.

Varying degrees of spastic paralysis are constant but rarely approach the flaccidity seen in equine botulism. Swallowing may become extremely difficult, but control of the tongue and saliva is retained. Frequently, if a gentle

stream of water is played upon the tongue, thus overcoming the obstacle of prehension with paralyzed lips, the patient will be able to swallow. An undisturbed patient, standing straddled with pendulant head and penis, can usually pull himself together temporarily if agitated. Somnolence rarely advances to complete coma and will respond transiently to physical stimulation. The recumbent patient can usually get up if so inclined. The tendency is to remain standing, especially if aided by breast or side rails. The latter are more useful than slings. Urine is dribbled involuntarily and bowel evacuations are scant.

A characteristic attitude in encephalomyelitis was aptly described in the words of our Badian groom in Trinidad. "He's plaiting when he's walking, his ears are hanging, and he's got a point of view of falling down."

Pupillary contraction, beginning early and persisting until death or recovery, is a constant symptom. It is in response to the oculomotor stimulation which occurs in myelitic disease, e.g. the encephalitis of canine distemper and rabies. No retinal changes were detectable except possibly an increase in density which inhibited distinction of the blood vessels and the optic disc. Ptosis accompanied somnolence.

Motor respiratory difficulty is seen early in the disease and is evidenced by reflex abdominal breathing and cessation of the normal costal effort. Throughout the neurologic course of the disease, a rhythmical "heave line" contraction of the greater oblique muscle is apparent, and can be interpreted as evidence of early damage to the respiratory center in the brain.

TRANSMISSION

Accidental laboratory infection^{17, 18} occurs in experimental manipulations of the virus and likewise from exposure in the manufacture of chick-embryo vaccine. Such incidences illustrate that infection is possible by contact, but the sequence of cases in an epizootic habitually illustrate characteristics of transmission by infected insect bite rather than contagion.

Cases were observed of intimate association of animals which never contracted the disease, or which did so as much as six weeks later. Isolated single cases as distant as seven miles from the nearest focus were seen. Donkey foals died at the side of normal dams. On March 4, a mare was seen in the fifth day of brain symptoms with a normal 10-day-old foal at her side. The foal had nursed until the previous evening; the mare died and the orphan never developed illness.

In Trinidad, we were able to demonstrate that natural immunes in an outbreak may be the result of a light initial mosquito virus inoculation producing subclinical infection followed by active immunity¹⁵.

Mosquito transmission of the North American types of the disease has been many times proved. Eleven different anophelines have been demonstrated as being capable of carrying and transmitting either eastern or western viruses and in some species both. Hammon¹⁹ and coworkers incriminated the first culicine (*Culex tarsalis*) and did so for not only eastern and western but likewise St. Louis virus. It was the first demonstration of infected mosquitoes collected in nature. The prime Trinidad vector, *M. titillans*, reported by Gilyard,¹⁵ is the second culicine to be incriminated and the mosquitoes worked with were likewise infected in nature.

RESERVOIRS OF THE VIRUS IN NATURE

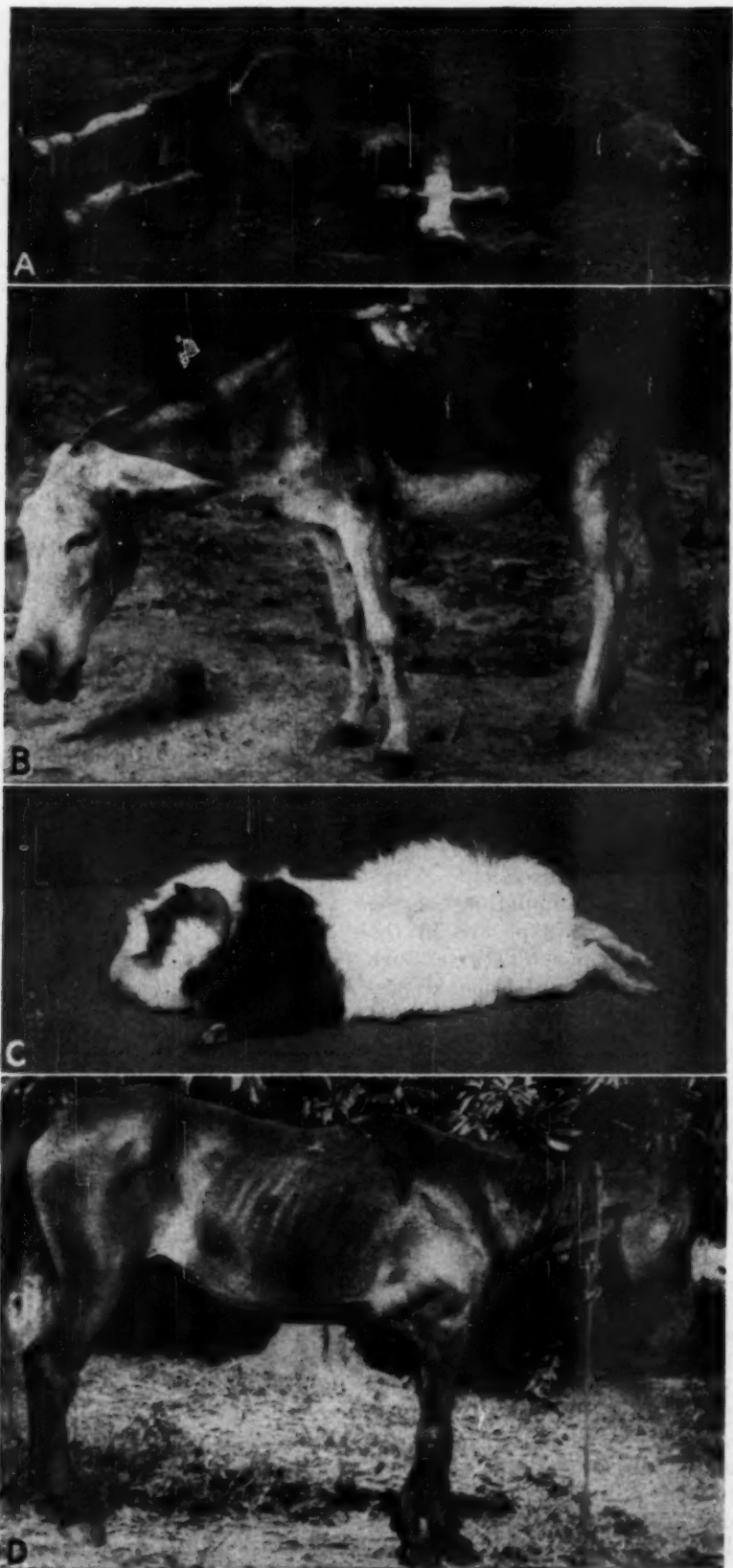
A limited attempt was made in Trinidad to determine the existence of virus hosts among wild mammals and birds.

Several weeks before the epizootic was apparent, a wild native deer was presented at the Army Veterinary dispensary in generalized paralysis and stupor. The animal died and brain sections revealed encephalitis. No biologic identification of the causative agent was undertaken. No further cases were reported.

On Nov. 1, 1943, 2 White Leghorn pullets were inoculated, 1 intracerebrally and 1 in the region of the sciatic nerve with a 10 per cent saline suspension of infected horse brain. Neither developed symptoms under observation for 119 days. On Feb. 27, 1944, both were destroyed. Suspensions prepared from their brains failed to produce any reaction when injected into 2 guinea pigs, intracerebrally, which indicated that brain localization of virus innocuous to the chickens had not transpired.

During the period Oct. 14 to 16, 1943, a capture of 20 vampire bats (*Desmodus rotundus murinus*) was made in the epizootic area. (They have been incriminated as vectors of paralytic rabies in Trinidad by Pawan.) It was not known whether any of the bats captured had fed on active cases of encephalomyelitis. Their brains were removed and 5 suspensions of 4 bat brains each were prepared. One guinea pig was inoculated, intracerebrally, from each suspension. None developed reaction to indicate that the bats worked with were carrying virus.

On Dec. 24, 1943, a captive monkey from a U. S. Navy installation, quite distant



—Photo by G. Rivas Larralde, Venezuela

Figure 3

from the epizootic area, was presented for examination. The animal was in profound coma with abolished reflexes and pin-point pupils. Euthanasia was performed, the brain removed, and with it 2 guinea pigs were inoculated, intracerebrally. Both died on the fourth day. Two Venezuelan immune guinea pigs were then inoculated with the original brain and both survived. This monkey was naturally infected with Venezuelan virus. A portion of the original brain was forwarded, in glycerine and saline, to the Army Veterinary School for further study. The case prompted a curiosity as to the susceptibility of monkeys to Venezuelan virus by artificial infection. A normal captive monkey was procured and injected, intracerebrally, with a suspension of horse brain which had been producing consistent fourth-day deaths in guinea pigs. The first day after injection, the monkey appeared quite drowsy; in the early morning of the second day, coma was profound and death occurred that evening.

Corbeau (buzzards) are abundant in Trinidad. They appear like magic anywhere on the island where there happens to be garbage or carrion to their liking. Some also believe that in their travels they go to and from the continent. Their living habits, and an extensive featherless area on the head and neck convenient for mosquito feeding, suggested that they might possibly become virus hosts. Accordingly, 5 were shot near the home of a child from whose cadaveric brain Venezuelan virus had been recovered²⁰. The 5 brains were pooled and a suspension prepared for inoculation of 3 guinea pigs. None came down, indicating that virus was not present in the corbeau selected for test. A more extensive consideration of them is believed to be logical.

EPITHELIOTROPIC HYPOTHESIS

An ulcerative stomatitis was observed with sufficient frequency in mule and

donkey cases to suggest that Venezuelan virus may likewise be epitheliotropic. The ulcers were elongated (1 to 2 inches) and appeared on the tongue margin and the buccal mucosa. Healing was rapid if the course of the case was favorable. A less common mucosal manifestation was epistaxis of pulmonary origin and hemorrhagic enteritis. Abortion was observed in 3 mares at four to five months gestation; all of them ultimately recovered. The abortions occurred well along in neurologic phases of the disease and in each case expulsion of the membranes was simultaneous. They may have been the result of a direct attack of the virus on the placenta; on the other hand, it can be regarded that the severity of the disease was too great to expect pregnancy to endure it.

In connection with an epitheliotropic possibility, Syverton, Cox, and Olitsky²¹ studied a generic relationship between the virus of vesicular stomatitis and western virus. They demonstrated that the latter produced vesiculation when injected in the tarsal pad of guinea pigs comparable with that produced by the former, and conversely, that vesicular stomatitis virus produced brain lesions comparable with those of western virus. Their filterability was quite identical. There was no cross immunity between them.

We were not able to produce vesiculation in our laboratory animals with the virus worked with at Trinidad, but we did not attempt to with virus isolated from a stomatitis case or with material collected from oral lesions. The stomatitis seen in the field occurred predominantly in donkeys and mules.

A total of 13 vaccinated animals contracted the disease. Two had received only one injection of vaccine. The "break" occurred approximately nine weeks after treatment and the animals involved were located well within the infected area, during a time in which new cases in nonvaccinated animals were being seen daily. The

Captions for Illustrations on Opposite Page

A—Cerebral irritation with reflex spasms.

B—Somnolent form of the disease with secondary congestion of the lips.

C—Moribund guinea pig in generalized paralysis, fourth day following intracerebral inoculation with infected horse brain.

D—A mixed neurologic syndrome.

vaccine used was from 2 different lots. With the first appearance of a "break" (Jan. 1, 1944) immediate steps were taken to retype the virus in order to determine

Vaccinated Animals Developing the Disease
(Official Report by H. V. M. Metivier)

ANIMAL	VACCINATION COMPLETED	ONSET OF DISEASE	OUTCOME
4 horses	11/15/43	1/1/44	died
1 horse	11/15/43	1/8/44	recovered
1 horse	11/1/43	1/8/44	recovered
3 donkeys	11/15/43	1/1/44	died
2 donkeys	11/22/43 ¹	1/18/44	died
1 donkey	11/15/43	2/24/44	died
1 donkey	11/18/43	2/15/44	died

¹one injection only.

if there was a co-existence of eastern or western, as well as the susceptibility of the virus involved to Venezuelan vaccine.

A suspension of horse brain tissue in normal saline from one of the cases which developed Jan. 1, 1944, was injected intracerebrally in a series of 8 guinea pigs, 2 of which were susceptible controls and 2 each eastern, western, and Venezuelan immunes. All perished in characteristic profound paralysis after temperature elevation with the exception of the 2 Venezuelan immunes which remained well and thus identified the "break" virus with the original.

In view of the fact that the animals involved in the "break" did not develop the disease until an average of approximately nine weeks after treatment, though exposed in the infected area, it can be theorized that an immunity was attained but of less duration than normally expected. Such an hypothesis might be explained by a protein interference phenomenon. There is an abundance of crude protein in chick-embryo vaccine and a reaction to it in some individuals is known to lower the antigenicity of the vaccine²². Early users of chick-embryo vaccine eastern and western by the 10-cc. subcutaneous method will recall X disease, a mysterious postvaccinal illness sometimes causing death. It is believed by some investigators that this was a severe form of chick-protein reaction now obviated by the intradermal method using only 0.10 of the original dose. Regard for chick proteins in unrefined vaccine is at present discouraging wide-scale use of the product for the prevention of the disease in human²³ beings.

Another point in connection with establishing solid immunity is the necessity of making accurate intradermal injections. If the vaccine is inadvertently placed under the skin, it is likely that the increased rate of absorption will lessen the extent of antibody formation.

An experiment was undertaken to determine if one attack of the disease conferred immunity. A mare, recovered from the disease in ninety-three days and indicating no neurologic residuals, was given a 10 per cent suspension in saline of donkey brain from a sacrificed case, 1 cc. intradermally and 5 cc. subcutaneously. Her temperature was then recorded twice daily for ten days; there was no fever or illness.

An attempt was made to determine if one injection of vaccine might be sufficient to protect donkeys. A crippled yearling donkey so treated was stabled in the screened animal house in order that she could not become "hypered" by the bite of infected mosquitoes. On the seventy-eighth day after single treatment vaccination she received the same infective dose of brain suspension as the mare. She did not develop temperature elevation or illness. The brain suspension used was simultaneously lethal for susceptible guinea pigs.

VACCINAL ACTIVATION OF INCUBATIVE INFECTION

When normal animals within the infected area were vaccinated, disastrous, acute cases sometimes developed forty-eight to seventy-two hours after the first injection of vaccine. I believe that such cases, although prefebrile at the time of treatment, were actually incubative (had received mosquito virus) and that the vaccine potentiated the disease. An interesting group observation was made in this connection.

Seventy-one mules were stabled in a large feeding pen on a sugar estate adjacent to the infected area (the nearest previous case 1½ miles). On Oct. 28, 1943, they each received an initial 1 cc. of vaccine, all of the same lot number (it was subsequently tested for sterility and used on a number of nonreacting animals). All were eating and appeared normal at the time of treatment.

On October 30 and 31, a number went off feed and were inactive. November 1

when temperatures were taken, 25 showed elevations ranging from 104 to 106 F. November 2, the sick group increased to 60 out of the 71. November 3, mild neurologic symptoms were apparent in 40 cases. November 4, 3 died and 1 was destroyed in uncontrollable violence. Somnolence was the predominate form of the disease. Fifty per cent of the group developed an ulcerative stomatitis. Recovery required two to three weeks. Ultimately, 15 (25%) died; none of the recoveries when examined six months later showed neurologic residuals although marked string halt, provoked by the disease in one case, persisted for three months and then spontaneously ceased.

An additional instance of enhancing the severity of existing infection with vaccine occurs when it is administered in the febrile period of the disease. Such cases invariably become worse at once and many, so treated, die prematurely within twenty-four to forty-eight hours.

Treatment.—The nursing care in the vaccinal activated group was excellent. There was an abundance of bedding in the pen (dried para grass and guinea grass). The walls and ends were open, encouraging ventilation, and a sheet iron roof protected against rain and sun. Sugar kettles were elevated chest high to facilitate drinking, and molasses was mixed in the water for added nourishment. Chopped cane tops and grain were fed in elevated mangers to aid prehension and swallowing.

Considerable therapeutic effort was made in this group. In Venezuela, intravenous urotropin (hexamethylenamine) is believed to be beneficial. Its original recommendation in the treatment of neurotropic virus diseases is German, but at this writing I am unable to find reference to the pharmacologic conception involved. We administered the treatment as done in Venezuela, 30 cc. of 40 per cent aqueous solution in the jugular, repeated at twelve to eighteen hours. We were unable to observe any benefit or, likewise, any untoward effect from it. We do believe, however, that there was significant benefit from convalescent whole blood. A donor was selected in the fifth week of recovery and citrated blood (300 cc.) was given to as many cases as possible. Although dramatic improvement changes can hardly be ex-

pected in the course of encephalomyelitis, it is believed that the percentage of recoveries was raised by treatment with convalescent blood. Three violent cerebral cases of a type at first considered hopeless and usually destroyed were treated by administering 2 oz. of chloral hydrate *via* a stomach tube, followed when quiet by transfusion. They recovered. All 3 were horses and after the initial chloral administration they had no further paroxysms of excitability.

Improvised nursing care is all important in the treatment of encephalomyelitis and although the mortality in the Venezuelan form of the disease is high (83.29% in Trinidad) we did not observe, even after six months, postencephalitic damage in recovered animals, which impaired their usefulness.

THE HUMAN PATHOGENICITY OF VENEZUELAN VIRUS

In Venezuela, a human form of the disease has not as yet been described. The first reported human diagnosis was by Casals, Curnen, and Thomas,¹⁷ in 2 laboratory workers who developed a mild disease while handling Venezuelan virus. Virus was isolated from the upper respiratory washings of 1 patient and specific antibodies were demonstrated in the convalescent serum from both.

In the same year, Lennette and Koprowski¹⁸ reported on 8 cases of laboratory infection which varied from mild illness to severe infection with central nervous manifestations. Virus was recovered from 6 of the patients (throat washings) and convalescent immunologic serum evidence was found in all 8.

The first reported human death occurred in Trinidad;^{14, 24} an American sailor died six weeks prior to the outbreak of the epizootic. Venezuelan virus was subsequently recovered from brain tissue stored in glycerine and saline.

A second human death occurred in Trinidad.²⁰ A 6-year-old child in Port of Spain, 60 miles from the epizootic area, developed an encephalitis lethargica and died Nov. 27, 1943, on the fourth day of her illness. Venezuelan virus was identified in her brain tissue by cross-immunity tests and the finding confirmed in material forwarded

to Col. Raymond Randall, V.C., at the U.S. Army Medical School.

Four additional human cases, which recovered with neurologic residuals, were seen. Biologic identity of a virus from them was not accomplished.

A dense native population in the epizootic area with lack of mosquito protection gave rise to a logical anticipation of a far greater number of human cases than occurred. It is theorized that the selective feeding habits of the prime equine vector, *M. tittilans*, may have influenced such a fortunate outcome. In the presence of an abundance of animal subjects to feed upon, this species was quite distinctly zoophilic. Adult mosquito collections were made on human bait in the epizootic area which illustrate this point. The subjects used were both East Indians and Negroes. Collections were made in killing tubes at dusk and early evening. The human bait was stationed close by living quarters as well as in fields with tethered animals. The following collections indicate the infrequency in which *M. tittilans* were detected feeding upon human subjects:

DATE	TOTAL NUMBER OF MOSQUITOES COLLECTED	MANSONIA TITILLANS
Dec. 7 to 12	304	16
Dec. 16	138	10
Jan. 9	54	0
	496	26

It is further believed that *M. tittilans* are particularly equinophilic. We were unable to persuade infected females, collected in nature, to feed upon laboratory animals and thus reproduce the disease, yet 50 per cent of the same group willingly fed upon a donkey colt and produced fatal infection.¹⁵

DISCUSSION

Clinical reports on Venezuelan equine encephalomyelitis in American veterinary literature are extremely limited. It is hoped that this preliminary study of the disease will familiarize American veterinarians and livestock men with it, and lead to its early recognition should it appear. The shifting behavior of eastern and western viruses across the Appalachian mountain barrier, and their interrupted appearances in the countries of Central and South

America serve well to exemplify such a warning.

Prelanding insecticidal treatment of Pan-American aircraft by Army, Navy, and U.S. Public Health authorities is scrupulously practiced to prevent the spreading of insect-borne diseases. Venezuelan horse virus has its place in this program, but the virus carrying potentialities of migratory birds between the Americas are not easily controlled. It is known that many birds can harbor the equine neurotropic viruses and can thus furnish infected insect feeding material throughout the course of their migrations.

The grave human danger in this disease is a public health challenge to the veterinary profession. Isolation of the virus by Meyer, Haring, and Howitt, and the determination of mosquito transmission by Kelser are the cues for comprehending natural infection in both animals and man. Control has become possible with chick-embryo vaccine when adequately prepared and properly used. Typing the virus in each outbreak becomes increasingly essential to the continued success of vaccination.

ACKNOWLEDGMENTS

In the preparation of this report, the author has used freely information attained from exhaustive work done by H. V. M. Metivier, senior veterinary officer of the colony, in vaccinal control of the disease and the compilation of statistical data.

Mosquito studies were largely made possible by the assistance of Tamarath D. Knigin, entomologist, Trinidad Sector Malaria Control Laboratory, U. S. Army.

The laboratory facilities at the Colonial Hospital, Port of Spain, and the assistance of the colonial pathologist, J. L. Pawan, were indispensable.

It is also desired to acknowledge with much indebtedness the help of Col. D. I. Stanton, M. C.; Col. Raymond Randall, V. C.; Vladimir Kubes; G. Rivas Larralde; D. C. A. Butts; Lieut. Stanley F. Yolles, Sn. C.; and Capt. Jasper S. Moore, M. A. C.

References

- ¹Phillip, C. B., Cox, H. R., and Fountain, J. H.: Protective Antibodies Against St. Louis Encephalitis Virus in the Serum of Horses and Man. Pub. Health Rep., 56, (1941): 1388.
- ²Cox, H. R., Phillip, C. B., and Kilpatrick, J. W.:

Susceptibility of Horses to St. Louis Encephalitis Virus. Pub. Health Rep., 56, (1941): 1391.

¹⁰Beck, C. E., and Wyckoff, R. W. G.: Venezuelan Equine Encephalomyelitis. Science, 88, (1938): 530.

¹¹Kubes, V.: Las Peste Loca de las Bestias. Sus Manifestaciones, Tratamiento y Prevención. Pub. del Minster, de Agricul. Y Cria, Venezuela. 1936.

¹²Kubes, V., and Rios, F. A.: Preliminary Data on the Etiologic Agent of Infectious Encephalomyelitis of Equines in Venezuela. Science, 90, (1939): 20.

¹³Rosenbusch, F.: La Inmunización Activa con el Virus de la Encefalomieltis Infecciosa en la Argentina. Estudio Comparativo con el Virus Californiano. An. del la Soc. rural Argentina, 68, (1934): 273.

¹⁴Kelser, R. A.: Equine Encephalomyelitis in Panama. Army Med. Bull. 31, (1937): 1.

¹⁵Carneriro, V., and Cunha, R.: Estudos Sobre a Encefalomieltis Infecciosa Dos Equideos No Brasil. Arq. do Inst. Biol., 14, (1943): 10.

¹⁶Higbie, E., and Howitt, B. F.: The Behavior of the Virus of Equine Encephalomyelitis on the Chorioallantoic Membrane of the Developing Chick. J. Bact., 29, (1935): 399.

¹⁷Beard, J. W., Finkelstein, H., Sealy, W. C., and Wyckoff, R. W. G.: Immunization Against Equine Encephalomyelitis with Chick Embryo Vaccine. Science, 87, (1938): 490.

¹⁸Lleras, and Figueroa: Aislamiento de un Virus de Caballo Atacado de, "Peste Loca." Bol. del Inst., Nac. De Hyg., Bogota, Col. 8, (1942): 1.

¹⁹Kubes, V.: Immunological Relations Between the Virus of Equine Encephalomyelitis of Colombia and of Venezuela. Bol. del Inst., Investig., Vet., Caracas, Venezuela. (Received for publication Jan. 1944.)

²⁰Larralde, Rivas, G.: Equine Encefalomieltis. Mem. Y Cuenta de Agricul. Y Cria de Venezuela, 65, 1943.

²¹Kubes, V.: Venezuelan-Type Equine Encephalomyelitis Virus in Trinidad. Science, 99, (1944): 2559.

²²Gilyard, R. T.: Mosquito Transmission of Venezuelan Virus Equine Encephalomyelitis in Trinidad. U. S. Army Med. Dept. Bull. 75, (1944): 96.

²³Randall, Raymond, Col., V.C.: Official Laboratory Report U. S. Army Med. School.

²⁴Casals, J., Curnen, E. C., and Thomas, L.: Venezuelan Encephalomyelitis in Man. J. Exper. Med., 77, (1943): 520.

²⁵Lennette, E. H., and Koprowski, H.: Human Infection with Venezuelan Equine Encephalomyelitis Virus. J. Am. Med. A., 123, (1943): 1088.

²⁶Hammon, W. McD., Reeves, W. C., Brookman, Izumi, and Gjullin, C. M.: Isolation of the Viruses of Western Equine and St. Louis Encephalitis from *Culex tarsalis*. Science, 94, (1941): 328.

²⁷Pawan, J. L., and Gilyard, R. T.: Fatal Human Infection with the "Venezuelan" Virus of Equine Encephalomyelitis (case report). (Pending publication in a British Medical Journal.)

²⁸Syvertson, J. T., Cox, H. R., and Oltisky, P. K.: Relationship of the Viruses of Vesicular Stomatitis and of Equine Encephalomyelitis. Science, 78, (1933): 216.

²⁹Kelser, R. A.: Personal Communication, Aug. 28, 1944.

³⁰Simmons, J. S.: Official Communication to Sector Surgeon, Trinidad Sector and Base Command, Nov. 2, 1943.

³¹Randall, R., Mills, J. W.: Fatal Encephalitis in Man Due to the Venezuelan Virus of Equine Encephalomyelitis in Trinidad. Science, 99, (1944): 2568.

The national Live Stock and Meat Board is backing thirteen scholarships at ten universities to carry out meat research.—*From National Live Stock Producer.*

Michigan Department of Health Wants Veterinarian

The Bureau of Laboratories of the Michigan Department of Health is desirous of obtaining a veterinarian to be in charge of animals used for production and tests of biological products. The position carries a senior rating in the biologics division of the laboratory.

Any interested veterinarian should communicate with Dr. G. D. Cummings, Director, Bureau of Laboratories, Michigan Department of Health, Lansing 4, Mich.

The Veterinary Corps in China



—Signal Corps, U. S. A. Photo

Working in the most rough and rugged terrain on earth, officers of the Veterinary Corps with the Chinese Expeditionary Force, working on the Stilwell (Ledo-Burma) Road have the important task of keeping pack horses and mules among the effectives. Animals are rare, indispensable, and valuable in dollars and cents in this faraway theater. The picture is of Capt. Joseph L. Gidley (Wash. '40), V.C., A.U.S., with his Chinese helper. "These men are rendering vital support to the fighting forces," the Bureau of Public Relations, U. S. Army, announces.

Spergon—Fungicide for Summer Eczema in Dogs

RAY D. HATCH, D.V.M., M.S.

Blacksburg, Virginia

MANY ATTEMPTS have been made in recent years to find the etiologic agent of eczema in dogs and to discover an efficacious treatment. Fleas, worm parasites, vitamin deficiencies, fungi, and autointoxication have been incriminated.^{1,2} Most of these appear to be implicated as predisposing, if not direct, causes.

Merrick³ contends that the common grass fungus, *Alternaria tenuis*, is partly, if not entirely, responsible for this dermatosis. Veterinarians have observed the elliptical, club-shaped spores of this fungus in their routine examinations of skin scrapings, but, not being mycologists, they have overlooked its possible importance. Postulating on the fungus origin of the disease, a nontoxic fungicide was sought as a medicinal remedy.

Spergon (= tetra-chloro-para-benzoquinone), a proprietary product, has been quite widely used by plant pathologists to control fungus diseases of plants, and it is known to be a highly potent agent against the more common plant fungi. Tested for toxicity, the material was found to be relatively innocuous, particularly in the quantity that would be consumed by licking.⁴

The animals used were not confined to one kennel or laboratory, and no other treatment was employed. Diet was not considered and no examination for internal parasites were made. Affected areas were scraped and the specimens examined under 100 diameter magnification, in order to exclude mange parasites. To insure better contact of the fungicide with the skin, the hair around the moist patches was clipped, and Spergon was dusted on and rubbed into and around the affected areas.

The material was used in three strengths: pure Spergon, powdered boric acid and Spergon, and Spergon and starch, each in equal proportions. All three were equally effective but the boric acid and Spergon mixture was easier to apply, being neither too light and dusty nor as likely to absorb atmospheric moisture.

All cases treated were classified as dry

or moist eczema depending upon the presence or absence of exudates on the affected areas. The size of the patches or the extent of the surface involved was not considered except as a record for determining the effect of the treatment. The result on the moist, patchy areas was little short of phenomenal. All cases of moist eczema, without exception, were definitely benefited within twenty-four to seventy-two hours. As the number of animals treated was small (15 cases), there may be many animals that will not respond as well as this small, unselected group.

Application of the powder at irregular or long intervals was less effective, but treatment oftener than three times a day did not increase the rate of healing or relief. The treatment of an area did not preclude the prospect of other areas becoming affected nor guarantee against relapse. There was no apparent advantage derived from dusting the whole body when only small areas were affected.

The results in diffuse, dry cases were less promising, since only about 50 per cent responded, and the benefit derived was chiefly that of stopping the severe pruritus. In this type of eczema, there may be pathologic changes in the hair follicles or deeper layers of the dermis which make the alopecia and dermatitis more lasting.

Spergon combined with an ointment base was not extensively tried. Only one case of moist eczema was treated with such an ointment, a mixture with boric acid and petrolatum. Recovery was slow but definite; benefit was derived after the second or third application.

None of the dogs showed any symptoms of toxicity even when extensive areas were dusted and the animals had ample opportunity to lick off much of the material.

References

- ¹Haigler, S. W.: Non-Parasitic Skin Diseases. Vet. Med., 30 (1935): 502-504.
- ²Kissileff, A.: The Etiology of Summer Eczema in Dogs. J.A.V.M.A., 101 (1942): 108-113.
- ³Merrick, A. C.: Personal communication. Aug. 26, 1943.
- ⁴McGavack, T. H., Boyd, L. J., Terranova, R., and Lehr, D.: Toxicity Studies with the Fungicide, Tetra-Chloro-Para-Benzoquinone (Spergon). J. Indust. Hyg. and Toxicol., 25 (1943): 98-111.

From the Department of Biology, Virginia Polytechnic Institute.

The material for this series of trials was supplied by Naugatuck Chemical, Naugatuck, Conn.

African Horse Sickness

(THE FOLLOWING material is condensed from an article, by Captain Albert Emminger, V.C., U. S. Army Forces in the Middle East, published in the *Medical Bulletin, Mediterranean Theater of Operations*, December, 1944. It was submitted for the JOURNAL's attention by Col. James E. Noonan, V.C., U. S. Army, lately of the 6th Service Command, Chicago, who has made a study of African horse sickness in Egypt and Palestine in association with Major W. A. Lawrence, V. C., U. S. Army, the theater veterinarian for the American forces in the Middle East, Col. Glyn Lloyd and Major C. S. Bassett of the Royal Army Veterinary Corps, and Dr. Salim Bey, director of the veterinary service of the Department of Agriculture of Egypt. The observation was carried to Palestine where active cases of the disease existed. In the foreword, Colonel Noonan recalls that horse sickness has been known to be present in South Africa for four hundred years but was never seen in Egypt until 1928. It was stamped out a year later, but reappeared in the Upper Nile region in 1942. Since

that time, it has followed the river down through the Cairo-Alexandria area to Lower Egypt, thence across the Mediterranean Sea or Sinai Desert to Sarafand, Palestine, a distance of 400 air miles, evidently through the carrying of the insect vectors by plane. Except for the donkeys of scattered nomad tribes, there is little soliped life between Egypt and the infected zone in Palestine. The study was made for the information of the veterinary officers of these regions, who may not have had the opportunity to observe outbreaks of this equine scourge. Besides, says Noonan, its spread to Europe, though somewhat remote, is a possibility.

The JOURNAL again compliments the Veterinary Corps, not alone for its service to the armed forces, but more particularly for the protective knowledge it accumulates for the peacetime civilian. That animal diseases are no less global than the war itself is one of those self-evident facts that war brings into the foreground for the people to ponder.—Editor.)

• • •

On July 31, 1944, the corporal in charge of stables at Camp Russell B. Huckstep, reported that 2 race horses had died of some disease at Heliopolis. The Royal Army Veterinary Corps became interested, as African horse sickness was known to be occurring in the area and all British horses were being immunized.

A typical case observed at Cairo on August 2, by British and American veterinarians was described as "a text book case" by Dr. R. A. Alexander of the Onderstepoort Veterinary Research Institute, long-time expert on horse sickness. The symptoms were: (a) pronounced edema of the supraorbital fossae (fig. 1); (b) injected conjunctiva with some petechiation; (c) cervical, pectoral, and preputial edema; (d) weak heart, and fast, weak pulse; (e) dyspnea and pronounced abdominal expiration, resembling heaves; (f) unwillingness to move about, stiff gait; (g) temperature 104 F. These symptoms developed a few days after vaccination, prior to conferring active immunity. The horse recovered as Dr. Alexander had predicted. One vaccinated horse suffered a severe anaphylactic shock manifested by swelling of the neck, head, and legs, lasting twelve hours, but fortunately such reactions are rare, since owners of good horses would avoid vaccination were such severe reactions numerous.

Simultaneously with the occurrence of this case, severe losses were reported among civilian horses in the Cairo area, and the disease was



Fig. 1—Pronounced swelling of the supraorbital fossae, edema of the cheek and parotid region.

seen in other British remount depots in Egypt. The first case appeared in the region of Cairo in February, 1944. By July, 500 cases had been reported in civilian animals. Out of 12,000 civilian and military (Egyptian) horses vaccinated, only 26 cases occurred after the latest postvaccination date of seventeen days. Of 665 British horses vaccinated, there was 1 anaphylactic shock. The first case occurred in British horses in July, 1944, and in one month there were 4 deaths, 5 destroyed, and 1 still sick. At one British army stable of 19 horses, 1 was destroyed and 18 vaccinated. Of these, 3



Fig. 2—Swollen tongue showing blue patches on the underside.

showed symptoms when vaccinated with the result that 2 died and 1 recovered. The deaths occurred one to eight days following vaccination.

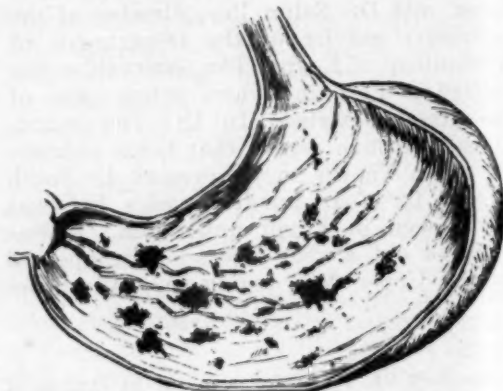
GENERAL

Major Bassett defines horse sickness as an infectious disease affecting horses, mules, and donkeys, only, and is caused by an ultramicroscopic virus transmitted by biting insects. Once confined to Cape Colony, it traveled north along rivers and low-lying lands and became a scourge of solipeds, accounting for thousands of deaths, making its first appearance as far north as Egypt in 1928. It is most prevalent in hot humid weather, receding with the coming of the cold season. The danger period in Egypt is from August to November, when the temperature is high and the Nile rises and much irrigation is done. Well-stabled horses are less frequently stricken, as the flies feed mainly at night. An outbreak in South Africa took 60,000 out of 80,000 animals, with a mortality of 90 per cent in horses, 70 per cent in mules, and 10 per cent in donkeys. Dogs and sheep, but not goats, are naturally susceptible, and all of these three species can be artificially infected. They are suspected of acting as the *virus reservoirs*, i.e., the source of supply for the biting insects that inoculate solipeds.

Horse sickness presents itself in four forms: (1) horse sickness fever, mainly of donkeys; (2) the pulmonary or explosive form (Dunkop); (3) the cardiac or edematous form (Dikkop—big head) (fig. 4); and (4) the mixed form.

The donkey form is a high fever lasting some

fourteen days with no other symptoms than those associated with high temperature. It has occasionally been seen in horses. The explosive form is a killer, too rapid to leave any antemortem symptoms to describe. The incubation period is two to five days; the duration from one hour to one day, respiratory trouble predominating. The cardiac or Dikkop form is the one seen mostly in Egypt. The symptoms are not as severe as those of the pulmonary or explosive or Dunkop form, and the mortality lower (fig. 1). The eyes, nostrils, and mouth (fig. 2) are implicated along with edematous swellings of the neck, brisket, and legs, which must be differentiated from the discrete swelling of anthrax. The period of incubation is one week and duration of the fever fourteen days. The postmortem findings are white froth in and around the nostrils, in the trachea and lungs, watery exudate of the pericardium and pleura, congestion of the



Ind. Vette. '44

Fig. 3—Pyloric portion of the stomach congested and showing areas that are port wine in color.

stomach and duodenum (fig. 3), and the characteristic subcutaneous infiltration (edema).

Horse sickness must be differentiated from urticaria, anthrax, purpura hemorrhagica, and hemorrhagic septicemia.

There is no successful treatment. Where nonimmune animals are exposed, the affected animals are killed and disposed of to prevent spreading. Vaccination has proved to be 90 per cent preventive. The vaccine is prepared at the Onderstepoort Veterinary Research Institute from seven selected strains of the virus, of which there are many. The vaccine produces a violent reaction that disables the animal for fourteen or more days. It is available in but limited amounts, and is, therefore, issued mainly for military animals. Immunity lasting for a year develops about two weeks after vaccination. Its keeping properties are very poor—ten days after leaving the laboratory, and that long only if kept at low temperature. Besides vaccination, all of the usual sanitary measures are enforced.

A gnat of the genus *Culicoides* is suspected of being the transmitting agent. An article

by Major C. S. Bassett, R.A.V.C., base depot, Middle Eastern Forces, describing the methods pursued in preparing the vaccine at the Onderstepoort institute, points out that while 23 strains of horse sickness virus have been iden-



Fig. 4—Dark red hemorrhagic areas on the heart surface and the large vessels.

tified, there are many others. The virus appears to undergo rapid ecological changes. In five years or less in one district, the virus may lose its antigenic properties for animals of another district.

Summarizing his thesis, Captain Emminger points out that the pulmonary and cardiac types of horse sickness, once confined to South Africa, have occurred in Malta, Egypt, Palestine, Syria, and other sections of the Middle East, that vaccination is effective but the supply of vaccine is small, and that clinical diagnosis rather than the laboratory must be depended upon.—[Captain Albert C. Emminger, V.C.: *African Horse Sickness. Illustrated. The Medical Bulletin of the Mediterranean Theatre of Operation*, 2, (December 1944):169-180.]

America's 27 million cows produced about 4,000 lb. of milk each in 1943, a total of 110 billion pounds.

Motion Picture Film on Bovine Gastric Fistula Available

Dr. A. F. Schalk, head of the Department of Veterinary Preventive Medicine at The Ohio State University, announces the availability of the recently completed motion picture, "Gastric Fistula Technique and the Interior of the Bovine Stomach," which was produced by Dr. Schalk and his associates at the College of Veterinary Medicine.

The film is 16 mm. Kodachrome, with a sound track about 800 feet in length and requiring twenty minutes for projection. As indicated by the title, the first part shows the surgical production of the fistulous opening in the rumen and the three different types of plugs used to keep the opening closed. The interior is then pictured, with anterior, lateral, and posterior views in which the normal physiological motility of the walls and pillars of the rumen and reticulum are vividly portrayed, with different levels of ingesta and with varying quantities of liquids present. The film also shows whole and ground corn, whole oats, and both dry hay and green alfalfa entering the rumen, and closes with the animal drinking several gallons of water. All the feeds and water can be seen very plainly as they emerge from the cardiac orifice, and their subsequent course and distribution.

The narrated script on the sound track gives a full description of the various procedures.

This is an excellent film and is suited for showing to professional groups and veterinary students. The film is available for loan on request or for purchase. Institutions which may be interested in purchasing a copy may write to Dr. A. F. Schalk, College of Veterinary Medicine, The Ohio State University, Columbus. Single copies cost about \$96.00, but if orders can be obtained for six or more copies, the price will be about \$76.00 each.

Don't be deceived by the march on Berlin. The war is not finished. Hitler is making some folks believe he's just been defending Europe against our invasion. At best, there is still a nonshooting war in Europe and the Japs to fight, besides the war on inflation that can carry away all you have, "just like that." The specific preventive is War Bonds.

SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

Surgical Reduction of a Diaphragmatic Hernia Without the Aid of a Forced Air Respirator

NORMAN L. GARLICK, D.V.M.

Tacoma, Washington

Subject.—Terrier-Pekingese, weight 12 lb., age 2 years.

History.—The dog was presented about 7:00 p.m. with the usual explanation that a bone had lodged in its throat. Some fried steak bones had been fed early in the day, and the dog had been uncomfortable and had attempted to vomit many times, but did not expel anything.

Examination.—Palpation of the throat and cervical regions was negative. The heart beat was strong and rapid. The mucous membranes were cyanotic and the breathing was labored, particularly after exertion. Fluoroscopy revealed the presence of a foreign body anterior to the diaphragm, in the upper part of the thoracic cavity.

On the basis of these findings, anesthesia and the passing of the stomach tube were recommended. With this the owner agreed, and left the dog in our care, with permission granted to do anything necessary to bring about recovery.

Anesthesia was obtained by the use of pentobarbital sodium. The stomach tube passed easily to the stomach with no interference. Correlating this and previous findings, we then suspected a ruptured diaphragm. Further history of a "little bump" by an automobile three weeks previously was obtained.

Operation.—Exploratory laparotomy was indicated. The hair was clipped from the abdominal region, and the field was washed thoroughly with a dilute solution of sodium hypochlorite.

The incision was made on the median line, extending from the xyphoid cartilage posteriorly about 4 inches. The first view of the interior of the peritoneal cavity revealed that the stomach was not therein.

The duodenum was located and traced to a point on the left of the median line where it disappeared through a rent in the diaphragm about 2 inches long. Gentle traction on the duodenum was applied, and the stomach, spleen, and a loop of the small intestine were slowly withdrawn from the left pleural cavity. At this point, the lungs collapsed and respiration ceased.

Manual pressure was quickly applied to the thorax, forcing the air out of the pleural cavity. A relative vacuum was maintained by covering the rent in the diaphragm with two fingers. Hemostats were applied, one by one, to the edges of the tear and clamped firmly in place, bringing the torn edges in apposition as nearly airtight as possible. The vacuum was broken many times during this process, but each time it was quickly restored by pressure on the thorax and the closing of the rent by the fingers.

When 14 of the forceps were in place, the diaphragm was again airtight with respiration continuing normally. One row of continuous Lembert stitches were inserted as follows: A small half-curved needle and 20-day chromic catgut No. 1 were used. The first stitch was inserted about ¼ inch ventrally to the end of the tear and tied securely. The Lembert stitches were then inserted, passing over 1 hemostat with each 2 stitches made. Each hemostat was removed as the 2 stitches were drawn tightly in place. The row was completed and all the instruments were removed. The serous surfaces of the peritoneum had been brought into apposition, and the pleural vacuum again was perfect. The stomach, which was greatly distended with air, was emptied by the use of a large syringe. The bones were left to

dissolve. Omentum was sutured over the needle hole and brought also over the repaired area of the diaphragm. The viscera were then returned to the peritoneal cavity and the abdominal incision was closed in the usual manner.

The principles of aseptic surgery were observed throughout the operation. The exposed viscera were kept moist by the frequent use of warm normal saline solution. One gram of sulfanilamide crystals was sprinkled on the viscera and in the abdominal incision before closure.

Surgical shock was great, the thermometer registering 92 F. at the completion of the operation. External heat was applied, and 1/120 gr. of strychnine sulfate was administered, hypodermically, every two hours. The temperature rose 2.5 degrees each hour, and in four hours was normal. At that time the dog took a small amount of water and was able to get up.

Recovery was uneventful. The last sutures were removed on the eighth day following the operation, at which time the dog was eating and feeling fine. A later report indicates that the operation was a complete success.

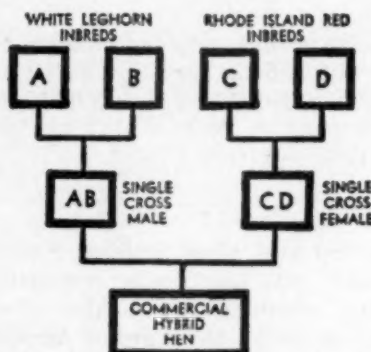
Castrate the Dogs

Tuning in on WLS, as usual, the other day to hear what's what in the field we serve, the commentator was caught quoting some statistics on farm animals killed by dogs: sheep, cattle, hogs, horses, exclusive of the animal victims of rabid dogs, which also run into sizable figures. And strangely, except for paying indemnities out of county treasuries, nothing much is done about it. Mere man is outwitted. Amid stacks of laws, rules, regulations, and suggested directives, *Canis domestica* remains as unmanaged and care-free as the wily coyote, obviously by common consent. Wildlife has the better plan. It pairs off to preserve the species as man has done since the era of prehistory. As a remedy, the rest of the domesticated fauna is subjected to the oldest of the veterinary surgical operations. Can dogdom forever dodge that operation? It can make a whale of a difference in the number of strays—the unsolved problem of the canine realm.

Old-age antiserum is announced by Moscow scientists. Its source and dynamics center upon the reticulo-endothelial system.

Hybrid Hens

Secretary of Commerce Henry A. Wallace, pioneer in the production of hybrid seed corn, and his son, Henry Brown Wallace, are credited (in the newspapers) with having produced a hardy hybrid hen that will raise the average egg production



by more than three dozen eggs per year over the average for the original breeds. The hybrid in question is a cross between inbred White Leghorns and inbred Rhode Island Reds. The breeding lines of the new hen are shown in Mendelian diagram.

The achievement is beyond the experimental stage. Tests have been made on more than 100 Illinois and Iowa farms during a period of five years. From one of these farms, cited as an example, comes the report that a flock of 400 pullets layed an average of 229 eggs their first year. If death losses are ruled out, the average would be 254 per pullet. The Pioneer Hi-Bred Corn Company, which controls the new venture, will market 260,000 hybrid chicks and 400,000 hybrid eggs this year.

The isolation of infantile paralysis virus in the brains of a thousand infected mice by Swedish scientists turns attention to that rodent as a vector of the virus.—*From Science Digest.*

In view of the extensive use of sulfa drugs in veterinary medicine, the specific sensitivity (allergy) to some of them reported in human medicine is a warning to watch for similar reactions in animals.

Do not use nembutal anesthesia in old dogs.—*Wayne H. Riser, D.V.M.*

CLINICAL DATA

Clinical Notes

The majestic trumpeter swan, a bird of 25 lb. with a wing spread of 8 ft., is being bred at the Red Rock Lakes Wildlife Refuge in Montana. A flock of 221 has doubled since 1935.—*Science Digest*.

Chewing at a fence, painted three years previously, was found to be responsible for the fatal poisoning of a number of experimental calves at the Purdue Agricultural Experiment Station. In addition to chemical analyses, the diagnosis was confirmed by duplicating the symptoms in normal calves with stated doses of lead salts.—*From J. Anim. Sci., February, 1945.*

A study of the growth of horses over a period of seven years (1927-1934) at the United States Range Livestock Experiment Station, Miles City, Mont., showed that horses kept under range conditions in summer matured somewhat smaller than horses well fed the year around. The difference was in weight rather than in height.

Penicillin in Phytotherapy

While still an X, the use of penicillin in agriculture seems to be in the offing. Workers at the Arizona Agricultural Experiment Station found that crude penicillin made at the cost of 2 cents a quart is destructive to *Agrobacterium tumefaciens*, the specific agent of crown gall of *Bryophyllum*. Galls covered with cotton soaked with penicillin and punctured through the wrapping to permit the drug to enter the gall structure effected its complete destruction. In addition, the work showed that penicillin can be destructive to gram-negative organisms. The crude penicillin was made by the Clifton method described in *Science*, July 16, 1943.

Contrary to possible beliefs, dicoumarol, the synthesized anti-coagulant factor of spoiled sweet clover hay, does not disintegrate thrombi or emboli. It only prevents their formation.

Dicoumarol, anticoagulant factor of spoiled sweet clover poisoning, although synthesized and available for medicinal use, has the fault of producing a prolonged state of uncontrollable hemorrhage unless its hematological effects are controlled by accurate daily determination of prothrombin and coagulation rate by a skillful laboratory technician. There are no well-known indications for dicoumarol in veterinary medicine.

Gastritis, A Rare Disease

No word is used more glibly in veterinary practice than gastritis. Texts on gastroenterology do not fail to give a long chapter to that particular "itis," yet in the course of autopsy work in animals, except in the case of the stomach having been actually "burned" by something swallowed, there is no gastritis. As to the human being, Bennett (*Proc. Roy. Soc. Med.*, Dec. 1944) asserts that in the course of considerable experience, he has not once succeeded in establishing a definite diagnosis of gastritis in any patient suffering from dyspepsia. Even gastroscopy is deceptive, since the reactions to stimuli (physical and mental) may be mistaken for inflammation as shown in "Human Gastric Function", by Wolf and Wolff who, in studies of the behavior of a human stomach for forty-seven years through a gastrostomy, necessitated by an esophageal stenosis, found that the rugosity of the gastric mucosa under the usual stimuli (food) accounts for the erroneous impression that gastritis is a common disease.

Studies on Ketosis in Dairy Cattle. VI. Is Ketosis in Dairy Cattle Due to a Vitamin A Deficiency?

J. C. SHAW, Ph.D., L. D. MATTERSON, Ph.D., M. E. SURGENOR, B.A., and
C. A. HOURIGAN, B.S.

Storrs, Connecticut

THE RECENT reports by Patton¹ suggesting that ketosis in cattle is due to a vitamin A deficiency are of interest because, if confirmed, they offer a possible explanation for the low incidence of ketosis in cattle on good pasture grass, and suggest that the specific antiketogenic effect of pasture grass may be due in part to its carotene content.

As a result of recent studies on the development of ketosis², we are suggesting as a working hypothesis that ketosis in cattle is associated primarily with inadequate nutrition prior to parturition, the effects of which may be the depletion of the liver glycogen and the impairment of the functioning of the liver in the maintenance of a normal liver glycogen and blood glucose level. This appears to happen at a time when the demands for glucose for milk secretion have increased the total glucose requirements sharply. This marked increase in the metabolism of the lactating gland undoubtedly plays a major rôle in the development of ketosis. Specific vitamin A studies had not been made previous to the present study as our field observations have not indicated that the feed received by cows which developed ketosis was deficient in this vitamin.

The experiments herein reported were conducted with the view of securing information of the possible relationship of vitamin A to the development of ketosis. The problem was investigated from two angles: (a) by determining the blood plasma carotene and vitamin A of cows with ketosis, (b) by treating cases of ketosis with massive doses of a vitamin A concentrate.

METHODS

The following methods were used: blood plasma carotene and vitamin A, Kimble³; blood

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glucose, Somogyi⁴; blood acetone bodies, Barnes and Wick⁵; blood plasma calcium, Clark and Collip⁶. Blood acetone bodies are expressed as milligrams of acetone per 100 cc. of blood. Citrated blood was used for the calcium determinations. Oxalated blood was used for the other determinations. The vitamin A concentrate used in these studies was kindly furnished by Distillation Products, Inc.

RESULTS

Only those cases were studied in which both the symptoms and the blood picture showed clearly that the condition was a ketosis, uncomplicated by milk fever, metritis, etc.

The data on each animal will be presented separately and then summarized in table form.

Case D.E. 151.—Breed—Ayrshire; date of parturition—3-5-44; signs and symptoms on 4-21-44—lethargy; decreased milk production; inappetence.

Since no complications were observed, case D.E. 151 was diagnosed as ketosis on the basis of the symptoms and the marked hypoglycemia and ketonemia. The values for plasma carotene and vitamin A indicate that the cow was not suffering from a vitamin A deficiency. One million I. U. of vitamin A were administered *per os* for six days without any apparent beneficial effects. The blood glucose did increase for the first three days but then decreased again. Such variations are frequently observed in untreated cases. There was no improvement in the appetite during the period of vitamin A administration. The day after the animal was turned out on pasture grass, blood glucose increased sharply; simultaneously, the blood acetone bodies decreased rapidly and the animal showed an improved appetite. No further symptoms of ketosis were observed.

Case D.E. 168.—Breed—Holstein-Friesian; date of parturition—5-1-44; signs and symptoms on 5-17-44—lethargy; decreased milk production; refused all feed.

Case D.E. 151

DATE	WHOLE BLOOD		BLOOD PLASMA		TREATMENT
	GLUCOSE (MG. %)	ACETONE	CAROTENE (μ G. %)	VITAMIN A (μ G. %)	
		BODIES (MG. %)			
4-21-44	24.41	56.34	225.0	33.6	1 M. I.U. vit. A per os
4-22-44	31.64	61.10			1 M. I.U. vit. A per os
4-23-44					1 M. I.U. vit. A per os
4-24-44	38.65	46.31	211.6		1 M. I.U. vit. A per os
4-25-44					1 M. I.U. vit. A per os
4-26-44	33.22	49.88			1 M. I.U. vit. A per os
4-27-44					on pasture
4-28-44	48.59	20.92			on pasture
5-2-44	42.49	5.14			on pasture

Blood plasma calcium, 4-21-44, 9.58 mg. per cent.
M = million.

Case D.E. 168

DATE	BLOOD GLUCOSE (MG. %)	BLOOD ACETONE BODIES (MG. %)	BLOOD PLASMA CAROTENE (μ G. %)
5-17-44	34.13	28.92	596.4

The blood plasma carotene value for case D.E. 168 indicates that there was no deficiency of carotene in the feed received by this cow. As a vitamin A concentrate was not administered, further values are not pertinent to this particular study and for that reason are not recorded here.

Case D.E. 169.—Breed—Jersey; date of parturition—4-1-44; signs and symptoms on 4-20-44—marked incoordination; inappetence; low in milk production.

became emaciated. On the ninth and thirteenth days after calving, 250 Gm. of glucose were again injected intravenously with a resultant temporary improvement in the animal's condition.

The vitamin A studies on this animal were initiated on the twentieth day after parturition; at which time the cow had suddenly refused all feed, decreased in milk production, and exhibited considerable incoordination again. Blood studies were not made prior to this time. The carotene and vitamin A data on case D.E. 169 again indicate that a deficiency of vitamin A was not the cause of the ketosis. Likewise, massive doses of vitamin A proved to be an ineffective treatment. The relatively

Case D.E. 169

DATE	WHOLE BLOOD		BLOOD PLASMA		TREATMENT
	GLUCOSE (MG. %)	ACETONE BODIES (MG. %)	CAROTENE (μ G. %)	VITAMIN A (μ G. %)	
4-20-44	31.64	14.53	205.1	28.8	1 M. I.U. vit. A intrav.
4-21-44	26.67	28.93	205.1	38.4	1 M. I.U. vit. A per os
4-22-44	40.91	22.74			1 M. I.U. vit. A per os
4-23-44					1 M. I.U. vit. A per os
4-24-44	31.19	33.70	235.4	16.8	1 M. I.U. vit. A per os
4-25-44					1 M. I.U. vit. A per os
4-26-44	24.86	40.23			1 M. I.U. vit. A per os
4-27-44			231.9	13.9	250 Gm. glucose intrav.
4-28-44	31.64	29.07			250 Gm. glucose intrav.
4-29-44					on pasture
4-30-44	44.75	12.87			on pasture; 250 Gm. glucose intrav.
5-2-44	38.65	9.92			on pasture

Blood plasma calcium, 4-20-44, 11.35 mg. per cent.
M = million.

Case D.E. 169 exhibited marked incoordination an hour after calving. Following the administration of 250 cc. of calcium gluconate intravenously, some temporary improvement was noted in the condition of the animal. However, the cow ate little and

slow response to glucose injections and pasture feeding was undoubtedly due, at least in part, to the incorrect treatment of the animal, during which time the condition had become considerably worse. On the initial day of treatment, the vitamin A was

injected as a fine emulsion of 5 cc. of oil concentrate in saline, using gum acacia and lecithin as the emulsifying agents. Although the droplets of oil were smaller than erythrocytes, the animal exhibited respiratory disturbance for about three minutes after injection. A much larger proportionate dose of the same emulsion did not have any noticeable effect upon a ewe.

Case D.E. 173.—Breed—Aryshire; date of parturition—3-10-44; signs and symptoms on 4-13-44—lethargy; inappetence.

The rapid improvement and return to normal of the blood glucose and acetone bodies between April 22 and 26 was probably due in part to pasture grass feeding and not to the administration of the vitamin A concentrate, as the plasma carotene and vitamin A were in the normal range.

Case D.E. 174.—Breed—Grade Guernsey; date of parturition—3-31-44; signs and symptoms on 4-17-44—marked incoördination; inappetence; decreased milk production.

Case D.E. 173

DATE	WHOLE BLOOD		BLOOD PLASMA		TREATMENT
	GLUCOSE (MG. %)	ACETONE BODIES (MG. %)	CAROTENE (μ G. %)	VITAMIN A (μ G. %)	
4-13-44	15.37	69.32			no treatment
4-21-44	32.77	35.79	131.6	24.0	no treatment
4-22-44	28.93	20.82			1 M. I.U. vit. A <i>per os</i>
4-23-44					on pasture
4-24-44	32.32	17.54	123.7	13.9	1 M. I.U. vit. A <i>per os</i> ;
					on pasture
4-26-44	46.10	3.88			on pasture

Blood plasma calcium, 4-21-44, 9.60 mg. per cent.
M = million.

Case D.E. 173 is typical of many cases of ketosis which improve without treatment. During the first nine days after symptoms of ketosis were first observed, the blood picture improved considerably and there was a noticeable improvement in the appetite and appearance of the animal, although the feed was not changed in any way and the animal did not receive treat-

The plasma values for carotene and vitamin A for case D.E. 174 indicate that the ketosis was not due to a vitamin A deficiency. The hay received by this cow contained 10,603 U.S.P. units of vitamin A per pound and constituted the only feed received by the cow for two months prior to parturition. As further evidence that a deficiency of vitamin A was not the cause

Case D.E. 174

DATE	WHOLE BLOOD		BLOOD PLASMA		TREATMENT
	GLUCOSE (MG. %)	ACETONE BODIES (MG. %)	CAROTENE (μ G. %)	VITAMIN A (μ G. %)	
4-17-44	17.63	57.71			none
4-20-44	27.12	46.75	134.3	14.4	250,000 I.U. vit. A intrav.;
					1 M. I.U. vit. A <i>per os</i>
4-21-44	31.41	37.98	150.8	28.3	1 M. I.U. vit. A <i>per os</i>
4-22-44	31.87	28.22			1 M. I.U. vit. A <i>per os</i>
4-23-44					1 M. I.U. vit. A <i>per os</i>
4-24-44	31.87	22.84	126.3	16.3	1 M. I.U. vit. A <i>per os</i>
4-25-44					1 M. I.U. vit. A <i>per os</i>
4-26-44	34.58	10.99	128.9	21.2	1 M. I.U. vit. A <i>per os</i>
4-27-44	29.15	22.52			1 M. I.U. vit. A <i>per os</i>
5-2-44	27.12	28.43			1 M. I.U. vit. A <i>per os</i>
5-4-44	28.52	33.05			2½ M. I.U. vit. A <i>per os</i>
					330,000 I.U. carotene and
5-6-44	30.28	50.93			2½ M. I.U. vit. A <i>per os</i>
					330,000 I.U. carotene and
5-8-44	20.34	55.46			2½ M. I.U. vit. A <i>per os</i>
					330,000 I.U. carotene and
5-9-44					2½ M. I.U. vit. A <i>per os</i>
5-10-44	37.52	41.72			on pasture
5-11-44	51.53	18.71			on pasture
5-12-44	63.51	8.72			on pasture
5-16-44	50.62	3.35			on pasture

Blood plasma calcium, 4-20-44, 9.10 mg. per cent.
M = million.

of the ketosis, massive doses of vitamin A supplemented by carotene, had no beneficial effect.

The initial intravenous administration of vitamin A as a fine oil emulsion caused a respiratory disturbance for a few minutes and was discontinued. Once again, a much larger proportionate intravenous dose had no noticeable effect upon a ewe.

During the 18 days of vitamin A treatment, the cow ate sparingly of hay and grain and showed an appreciable loss of flesh.

Case D.E. 191.—Breed—Jersey; date of parturition—4-1-44; signs and symptoms on 4-29-44—refused all feed; decreased sharply in milk production; lethargy.

Case D.E. 191 exhibited very severe ketosis. The animal refused all feed for a period of seven days and lost flesh rapidly. The carotene and vitamin A content of the plasma indicate that the animal had been receiving sufficient vitamin A. Massive doses of vitamin A *per os* exerted no beneficial effect. After three days of such treat-

Case D.E. 189

DATE	WHOLE BLOOD		BLOOD PLASMA		TREATMENT
	GLUCOSE (MG. %)	ACETONE BODIES (MG. %)	CAROTENE (μ G. %)	VITAMIN A (μ G. %)	
4-21-44	24.18	33.87	768.0	14.4	none
4-22-44	22.15	36.44			1 M. I.U. vit. A <i>per os</i>
4-23-44					1 M. I.U. vit. A <i>per os</i>
4-24-44	19.66	34.96	754.0	43.3	1 M. I.U. vit. A <i>per os</i> ; on pasture
4-25-44	28.02	27.46			1 M. I.U. vit. A <i>per os</i> ; on pasture
4-26-44					1 M. I.U. vit. A <i>per os</i> ; on pasture
4-28-44	27.12	13.90			on pasture
5-2-44	22.83	11.02			on pasture
5-11-44	40.00	7.44			on pasture
5-16-44	30.74	9.08			on pasture
5-21-44	46.78	8.84			on pasture

Blood plasma calcium, 4-21-44, 9.70 mg. per cent.
M = million.

The apparent antiketogenic effect of pasture grass was very striking in this case. The blood glucose increased from 20.3 to 51.5 mg. per cent. within three days after the cow was allowed access to pasture. A further increase to 63.5 mg. per cent was noted on the following day, a value considerably above normal. Blood glucose values of this magnitude have been observed frequently in cases exhibiting rapid recovery.

Case D.E. 189.—Breed—Guernsey; date of parturition—4-1-44; signs and symptoms on 4-20-44—incoördination; inappetence; decreased milk production.

The blood plasma carotene and vitamin A data for case D.E. 189 indicate that the ketosis was not due to a vitamin A deficiency. Little can be said regarding the efficacy of the vitamin A therapy because the cow was allowed access to pasture. However, after two days of oral administration of one million I.U. of vitamin A per day, there was no improvement. The effect of pasture grass feeding in this case was not as striking as that noted in case D.E. 174.

ment, it was necessary to resort to glucose injections to save the animal. The slow response to glucose injections was undoubtedly due in part to the incorrect treatment the first three days after the first symptoms were observed. As a result, the condition of the animal became more severe. Although glucose injections were made on four successive days, the response was very slow. It was not until the fifth glucose injection in six days had been made that the cow was induced to eat. At that time she ate grass sparingly.

This case was not unlike many that veterinarians are called upon to treat. It is apparent that to promote rapid recovery in stubborn cases of this kind, it is necessary to administer glucose at frequent intervals over a considerable period of time.

The intravenous injection of vitamin A in this case consisted of crystalline vitamin A in the form of a permanent sol made by dissolving the vitamin A in acetone and then adding slowly to saline while stirring vigorously. A mild reaction was again

Case D.E. 191

DATE	WHOLE BLOOD		BLOOD PLASMA		TREATMENT
	GLUCOSE (MG. %)	ACETONE BODIES (MG. %)	CAROTENE (μ G. %)	VITAMIN A (μ G. %)	
4-29-44	19.89	37.55	296.4	24.0	45,000 I.U. vit. A intrav.;
4-30-44	17.85	56.32			4 M. I.U. vit. A per os
5-1-44	14.92	73.33	251.6	28.8	3½ M. I.U. vit. A per os
5-2-44	16.27	73.33			3½ M. I.U. vit. A per os
5-3-44	23.50	66.11			250 Gm. glucose intrav.
5-4-44	32.32	72.97			250 Gm. glucose intrav.
5-5-44	33.90	63.61			250 Gm. glucose intrav.
5-6-44					on pasture
5-8-44	34.58	33.35			on pasture; 250 Gm.
					glucose intrav.
5-11-44	37.97	23.11			on pasture
5-13-44					on pasture; ate vigor-
					ously and appeared nor-
					mal
5-17-44	42.71	4.40			on pasture

M = million.

noted after 5 cc. had been injected, so the injection was discontinued. Five times this quantity had no apparent effect upon a ewe. The acetone was not a factor as it was removed completely by vacuum.

Case D.E. 198.—Breed—Ayrshire; date of parturition—4-13-44; signs and symptoms on 5-13-44—incoördination; general stiffness; neck partially paralyzed; spinal curvature; eating hay only.

Since vitamin A was not administered in this case, only the initial data on blood substances are pertinent to this report.

Case D.E. 198

DATE	BLOOD GLUCOSE (MG. %)	BLOOD ACETONE BODIES (MG. %)	BLOOD PLASMA CAROTENE (μ G. %)
5-13-44	26.89	48.38	238.9

The carotene value of 238.9 μ g. per 100 cc. of plasma indicates that the ketosis was not caused by a deficiency of carotene in the diet.

SUMMARY AND DISCUSSION

The data on the eight cases herein reported are summarized in table 1 for purposes of greater clarity and for discussion.

These cases were all diagnosed as uncomplicated ketosis on the basis of the symptoms and the blood analyses. Blood plasma calcium was determined in 5 of the cases to determine if the ketosis was complicated with milk fever.

The average blood plasma carotene and vitamin A for the 8 cows was 324.5 μ g.

per cent. and 23.2 μ g. per cent., respectively. Boyer *et al.*⁷ have reported that a minimum plasma vitamin A level of 10 μ g. per cent. was necessary for the growing calf, and that blood plasma carotene levels which would maintain an adequate blood vitamin A were 50 to 70 μ g. per cent of carotene for Holstein-Friesians and 110 to 140 μ g. per cent of carotene for Guernseys. Sutton and Soldner⁸ reported average values for 8 Ayrshire, 6 Guernsey, and 4 Holstein-Friesian cows. The blood plasma vitamin A and carotene levels were about 16 μ g. per cent and 400 μ g. per cent, respectively, one week before calving, and 7.5 μ g. per cent and 220 μ g. per cent, respectively, three days after calving. Kuhlman and Gallup⁹ reported normal values from 63 calving records of 30 high-grade Jerseys in which the average blood plasma carotene level was 169 μ g. per cent before calving and 134 μ g. per cent after calving.

Moore *et al.*¹⁰ have found that 66 μ g. of carotene per kilogram of body weight during the winter months is about the minimum requirement for Holstein-Friesian and Ayrshire calves from 4 to 14 months of age when spinal fluid pressure is used as a criterion. On the basis of plasma vitamin A and carotene levels, they were able to distinguish between carotene intakes of 44 and 75 μ g. per kilogram of body weight but not between such narrow limits as 62 and 75. The highest values reported by Moore *et al.*, at the end of periods of from seven to twelve months, on dietary intakes of from 66 to 75 μ g. of carotene per kilogram of body weight, were 82 μ g. per cent of

carotene and 11 $\mu\text{g.}$ per cent of Vitamin A. While not strictly comparable because of the age differences and in some cases the breed differences, it will be observed from table 1 that the blood plasma carotene and vitamin A values on the cows with ketosis were higher in all cases. The average blood plasma carotene and vitamin A values of

Unpublished data from our laboratory indicate that considerable caution must be exercised in the diagnosis of ketosis in those cases in which the condition is complicated by metritis, milk fever, etc. The blood glucose has been observed to decrease to 35 mg. per cent and even lower due to indigestion and other abnormali-

TABLE 1—Carotene and Vitamin A Content of the Blood Plasma of Cows with Ketosis

CASE	BREED	WHOLE BLOOD		BLOOD PLASMA		
		GLUCOSE (MG. %)	ACETONE BODIES (AS ACETONE) (MG. %)	CALCIUM (MG. %)	CAROTENE ($\mu\text{G. \%}$)	VITAMIN A ($\mu\text{G. \%}$)
D.E. 151	Ayrshire	24.41	56.34	9.58	225.0	33.6
D.E. 168	Holstein-Friesian	34.13	28.92	...	596.4	...
D.E. 169	Jersey	31.64	14.53	11.35	205.1	28.8
D.E. 173	Ayrshire	32.77	35.79	9.60	131.6	24.0
D.E. 174	Gr. Guernsey	27.12	46.75	9.10	134.3	14.4
D.E. 189	Guernsey	24.18	33.87	9.70	768.0	14.4
D.E. 191	Jersey	19.89	37.55	...	296.4	24.0
D.E. 198	Ayrshire	26.89	48.38	...	238.9	...
Average		27.63	37.77	9.87	324.5	23.2

324.5 $\mu\text{g.}$ per cent and 23.2 $\mu\text{g.}$ per cent compare quite favorably with values on normal cows reported by Sutton and Soldner, Kuhlman and Gallup and others.

These data appear to establish the fact that the 8 cases of ketosis reported in this paper were not caused by a vitamin A deficiency in the diet. The negative results obtained from vitamin A therapy would seem to confirm this observation. The cases studied represent a good cross section of eastern Connecticut cattle and are typical of a much larger number of cases observed in Connecticut during the past four years.

Whether a vitamin A deficiency will produce ketosis is outside the scope of this paper. It might be pointed out, however, that Patton has reported carotene and vitamin A data on only 2 cases in which there was a marked hypoglycemia and ketonemia and in which the cases appeared to represent uncomplicated ketosis. In 1 case, the blood plasma carotene and vitamin A values were 1580 I.U. per 100 cc. (940.1 $\mu\text{g.}$ per cent*) and 88 I.U. (17.3 $\mu\text{g.}$ per cent†), respectively. In the other case, the blood plasma carotene and vitamin A values were 1035 I.U. per 100 cc. (619.8 $\mu\text{g.}$ per cent) and 4 I.U. per 100 cc. (0.89 $\mu\text{g.}$ per cent), respectively. It is difficult to conceive of a vitamin A deficiency with such high blood plasma carotene values.

*1 Gm. of pure carotene contains 1,670,000 I.U.

†1 Gm. of pure vitamin A contains 4,500,000 I.U.

ties, and the blood acetone bodies have been observed to increase to 10 mg. per cent or even above, under such conditions. It is deemed important, therefore, in the analysis of data obtained on field cases of ketosis that only those cases be used in which the hypoglycemia and ketonemia are marked and in which there are no evidences of abnormalities other than those associated with ketosis of an uncomplicated nature.

The rapid recovery observed in several cases in which the animals were allowed access to pasture appears to confirm our earlier report¹¹ that pasture grass exerts a specific antiketogenic effect. We do not wish to comment further on this particular phase of the work until more data are available, as many cows with ketosis have been observed to recover in a relatively short period of time without treatment. Unless a large amount of data is obtained, negative results following treatment are more conclusive than positive results.

CONCLUSION

- 1) The blood plasma carotene and vitamin A values were normal for 8 cases of uncomplicated ketosis in cows.
- 2) The oral administration of from one to four million I.U. of vitamin A for periods of as long as three weeks had no beneficial effect.

- 3) Pasture grass appeared to be very beneficial in promoting the recovery of cows with ketosis.

ACKNOWLEDGEMENT

The authors wish to express their appreciation to E. R. Dimock, D.V.M., of Merrow, Conn., for his coöperation in this work.

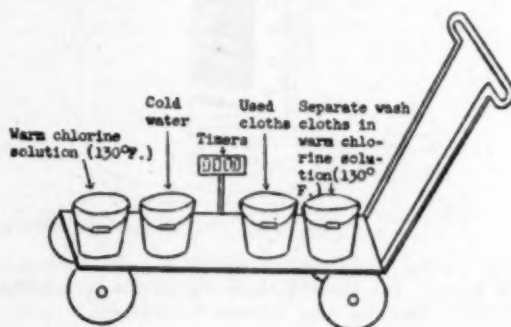
References

- ¹Patton, J. W.: Acetonemia, a Vitamin A Deficiency. *Vet. Med.*, 39, (1944): 150-153. *Ibid.*, 271-278.
- ²Shaw, J. C.: Studies on Ketosis in Dairy Cattle. V. The Development of Ketosis. *J. Dairy Sci.*, 26, (1943): 1079-1090.
- ³Kimble, M. S.: The Photocolorimetric Determination of Vitamin A and Carotene in Human Plasma. *J. Lab. and Clin. Med.*, 24, (1939): 1055-1065.
- ⁴Somogyi, M.: A Reagent for the Copper-Iodometric Determination of Very Small Amounts of Sugar. *J. Biol. Chem.*, 117, (1937): 771-776.
- ⁵Clark, E. P., and Collip, J. B.: A Study of the Tisdall Method for the Determination of Blood Serum Calcium with a Suggested Modification. *J. Biol. Chem.*, 63, (1925): 461-464.
- ⁶Barnes, R. H., and Wick, A. N.: A Method for the Determination of Blood Acetone Bodies. *J. Biol. Chem.*, 131, (1939): 413-423.
- ⁷Boyer, P. D., Phillips, P. H., Lundquist, N. S., Jensen, C. W., and Rupel, I. W.: Vitamin A and Carotene Requirements for the Maintenance of Adequate Blood Plasma Vitamin A in the Dairy Calf. *J. Dairy Sci.*, 25, (1942): 433-440.
- ⁸Sutton, T. S., and Soldner, P. A.: The Effect of Parturition and Beginning Lactation on the Level of Carotene and Vitamin A in the Blood Plasma of Dairy Cows. *J. Dairy Sci.*, 26, (1943): 740.
- ⁹Kuhlman, A. H., and Gallup, W. D.: Changes in Blood-Plasma Carotene Associated with Parturition and Lactation of Jersey Cows. *J. Dairy Sci.*, 27, (1944): 633-634.
- ¹⁰Moore, L. A., Berry, M. H., and Sykes, J. F.: Carotene Requirements for the Maintenance of a Normal Spinal Fluid Pressure in Dairy Calves. *J. Nutrition*, 26, (1943): 649-658.
- ¹¹Shaw, J. C., Powell, R. C., Jr., and White, G. C.: Studies on Ketosis in Dairy Cattle. IV. The Effect of Glucose Therapy and Pasture Feeding in Cases of Clinical Ketosis. *J.A.V.M.A.*, 100, (1942): 473-478.

"Keep 'Em Milking"

"Keep 'em Milking" is the banner of a bulletin on bovine mastitis issued to Illinois dairymen by the Department of Animal Pathology and Hygiene Extension Service in Agricultural Economics, University of Illinois. The bulletin gives a brief but comprehensive outline of the significance of mastitis—its incidence (45% of 2,000 cows), its control through herd management, milking schedule, barn sanitation, herd hygiene, early diagnosis, laboratory tests, and the treatment which (quoting) "should be supervised by an experienced veterinarian."

The equipment recommended to facilitate compliance with a sustained program of eradication is shown herewith.



The Illinois authorities have divided the state into seven strategic dairy areas," each in charge of a fulltime veterinarian directed to demonstrate the value of a herd program among dairymen. Beamer (Ringwood), Brown (Geneva), Bryan (Freeport), Hill (Edwardsville), Shaw (Effingham), Shutz (Galesburg), and Mendenhall (Kankakee) are in charge of approximately 250 herds in these districts—collecting samples for checking each cow, making farm demonstrations, and discussing the control of chronic mastitis. Since April, 1944, 21 mastitis-free herds have been developed and a reduction from 42 to 23 per cent in the other coöperating herds. Since dairymen need the service of veterinarians in diagnosis, treatment, and supervision of mastitis, and less than one half of one per cent of the herds of the state have been touched, all veterinarians are urged to take an active part in the program.—From *Demonstrational Project No. 6, University of Illinois*.

Dynamics of Insecticides

The killing power of insecticides is said to be due to an action peculiar to each: (1) inhalation and dispersion by way of the respiratory organs, (2) absorption and dispersion *via* the cuticle, and (3) upsetting the water balance (death by thirst) through blocking cuticular absorption of moisture. Fineness of the particles (sprays, dusts) is an essential killing property. Coal clinkers, ground to an extremely fine dust, inert as it is otherwise, is deadly to certain beetles, weevils, moths, and bugs by depriving the insects of vital moisture.

The "Vena Flask" Useful in Veterinary Practice

Williams and Roach (*The Veterinary Record*, Jan. 27, 1945) invite attention to an apparatus originally designed for human medicine but which has many applications in veterinary practice, particularly for injecting large amounts of fluids and for collecting and dispensing large blood samples.



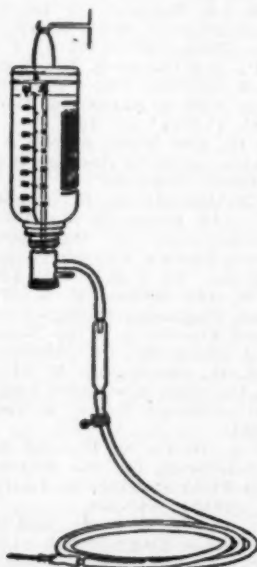
—Courtesy of *The Veterinary Record*

Fig. 1—The apparatus assembled for the collection of blood. For large animals the needle is inserted into the tube without the adapter.

The Vena Flask, obviously trade named, consists of a bottle of hard, durable glass, of 1 liter capacity, graduated in cubic centimeters and ounces for use in both upright and inverted positions. A metal loop is fitted to the bottom for hanging. There are both inner and outer caps to protect the contents from contamination, and wire gauze is fitted over the outlet to prevent clots or foreign particles from entering the delivery tubing, which is of sufficient length to allow for movements of the recipient or of the donor. The dispensing tube within the flask reaches to the top of the inverted bottle and the outside tubing is fitted with a glass "drip section" for watching the stream. The flow is regulated with a pinch clip and by the height from which the bottle is suspended. For large, rapid collections from large animals, a French's blood needle is used without the adapter. For every 100 cc. of blood to be drawn, 10 cc. of

sodium citrate, 3.8 per cent solution, is placed in the bottle. The flask is rotated to mix the instreaming blood with the citrate solution as fast as it flows in. For dispensing the contents under positive pressure in lieu of gravity, the delivery channel is fitted with a stem for attaching an air pump (rubber bulb).

While the apparatus does not introduce any new principle of the art in question, the integrated assemblage is worthy of praise for completeness and simplicity.



—Courtesy of *the Veterinary Record*

Fig. 2—Apparatus assembled for dispensing its contents. Note (1) loop of wire for hanging, (2) dispensing tube extends to the top of the inverted flask, (3) stem near outlet for attaching an air pump when positive pressure is wanted, (4) glass tubing for observation, (5) pinch clip for stopping and regulating the flow.

The authors enumerate the many indications of this type of apparatus in laboratory and clinical work, including the storing of blood samples in the flask from three to four weeks at low temperature; the preservation of culture mediums, especially agar; intramammary treatments of mastitis and milk fever; blood and saline trans-

fusions for hemorrhage and shock; and various intravenous injections in sizable doses.—*R. E. Williams and R. W. Roach, Bristol, England: "The 'Vena Flask,' A Useful Apparatus in Veterinary Practice." The Veterinary Record, 57, (Jan. 27, 1945): 37.*

Heard at the Illinois Meeting

There should be a lapse of two weeks between culture-serum vaccination for swine erysipelas and serum-virus vaccination for cholera.—*J. D. Ray, D.V.M.*

When the delayed use of virus is resorted to in the serum-virus vaccination of hogs, the injection of the virus should not be delayed more than ten days.—*Ibid.*

The immunity of pigs born of cholera-immune sows is incomplete and transient.—*L. M. Darst, D.V.M.*

Although not uncommon in dogs, leptospirosis does not constitute a serious public health problem.—*Ibid.*

We have gone far astray in the use of the word mastitis.—*R. A. Hendershott.*

Teat patency and stricture are to be considered first in the treatment of mastitis.—*Ibid.*

A radio in the cow stable at milking time is not a fantasy. Its purpose is to get cows accustomed to different voices which tend to disturb them.—*Ibid.*

Mastitis in cows is essentially a wound infection and, therefore, a surgeon's problem.—*W. F. Guard.*

Traffic in animals through the sale of purebred animals and community sales has spread nearly every disease to almost every community.—*President L. A. Gray.*

The discovery of new diagnostic agents, chemicals, antisera, vaccines, and surgical techniques have greatly increased the veterinarian's usefulness.—*Ibid.*

Abortion "Storms"

Asked whether test and slaughter with indemnities is economically and scientifically sound in a herd of cattle suffering from a so-called abortion "storm," Dr. Herbert Lothe replied:

In such herds, the test and slaughter method with indemnity is not only economically unsound but it is also scientifically unsound. In some of these problem herds, the repeated testing and removal of reactors eventually takes the entire herd. Herd additions must be made if the milk production is to be maintained and, instead of controlling the disease, it is really being propagated because the negative, uninfected animals brought into the infected environment soon become positive.

The discussion stressed the definite value of strain 19 vaccine in adults to "take the edge off the infection" in the case of "storms," and to avoid its use (in adults) in negative herds—negative in abortions and blood reactions.—*From Panel Discussion on Brucellosis, the Journal, March, 1945, P. 141.*

Calcium Gluconate Subcutaneously

The frank mention of abscess following the use of calcium gluconate in the treatment of milk fever, in British veterinary literature, appears to indicate that the intravenous method of administering this drug is not as commonly practiced as in the United States and that the dose used is smaller. A recent letter to the *Veterinary Record* (Jan. 27, 1945) reads in part: "I think that if practitioners adopt the following prescription for the boro-gluconate injection, they will have no further abscess trouble." The formula recommended consists of calcium gluconate, 2 oz.; boric acid, 3 dr.; carbolic acid, 30 m.; water 12 oz. The gluconate and boric acid are boiled before adding the phenol. Although made up in larger quantities, "a 12-oz. bottle is filled up before going to a milk fever case," the writer states. The letter is signed P. S. and R. P. Morgan, practitioners of Ross-on-Wye, who add, "We have never had any abscess formation since adopting this method." The main conclusion to be drawn, however, is that 12 oz. of a 16.6 per cent solution of calcium gluconate given subcutaneously has the curative equivalence of our 12 oz. 23 per cent solutions given intravenously.

Facts About DDT Insecticides

Entomologists from the U. S. Department of Agriculture point out that experiments during two years have demonstrated "that DDT is a promising chemical against a number of agricultural pests," but that it "is not a cure-all or panacea for all insect problems."

Public interest has been stimulated by more than 500 articles that were written about DDT in 1944 and by the knowledge that the U. S. military forces used the drug in controlling a typhus epidemic in Naples and in removing body lice from civilians in several foreign countries.

More than 170 different species of insects entered into these experiments. Thirty of these can be controlled more readily with DDT insecticides than with others currently used.

DDT is not recommended for general use at this time, even against those insects upon which some experiments have shown it to be particularly effective. Of this group, the following are of particular interest because they affect human and animal health: mosquitoes, bedbugs, three kinds of lice on man, houseflies and fleas in buildings, and horn flies on cattle.

While it has been learned that DDT insecticides can kill many insects, too little is yet known about the harm it may do to beneficial insects, plants, soil, livestock, wildlife, or to consumers of fruits and vegetables containing DDT residues.

DDT in Brown Dog Tick Infestation

The brown dog tick can easily be controlled by DDT, according to officers of the Sanitary Corps speaking at the recent demonstration school at Hampton Roads. Insects were described as a threat to the health of troops and animals, especially in large-scale operations and army camps. Extermination now of insects harmful to soldiers in Army Camps was recommended as an aid to the postwar civilian in town and country. That the brown dog tick was specially mentioned among the flies, roaches, and miscellaneous insects vulnerable to the action of DDT, is delightful news in the field of canine practice and hospitalization. However, the speakers stressed that chief reliance in control of insect carriers of diseases is to be placed upon cleanliness, use of screens, and similar preventive measures.—*From Release of the Third Service Command.*

An investigation carried out at Duke University at the request of the Quartermaster General, U. S. Army, revealed no evidence to substantiate the promiscuous use of vitamins. On the contrary, among the 200 medical students who volunteered to participate in the experiment, those receiving liver extract tablets or yeast tablets along with the vitamin tablets showed significant increases in diarrhea, abdominal pain, and nausea.

Graphic Lesson in Helminthology



Which one
is yours?



—From Live Stock Sanitary Committee

These are great pictures because of their simplicity and the big story they tell the sheep-raising industry of the Middlewest, where stomach worms take an amazing toll in food and wool poundage. Along with its publication, the Live Stock Sanitary Committee headquarters at Sioux City reminds all concerned that the feeding of phenothiazine-salt mixture during the pasture season supplements, but does not replace, drenching the ewes in the spring with a medicinal dose of that reliable anthelmintic.

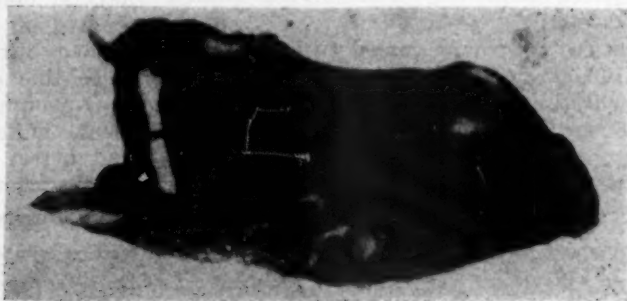
Notes on Equine Infectious Anemia

While investigating outbreaks of swamp fever (= equine infectious anemia) in the Ottawa River Valley in 1930, Mitchell, Humphreys, and Walker¹ of the Dominion veterinary service, reconfirmed the doctrine

The disease occurred in acute, subacute, and chronic forms and presented the usual confusion of syndromes which led attending veterinarians to diagnose some of the field cases as influenza, hemorrhagic septi-



Left.—Incoördinate gait of swamp fever cases.



Below.—Acute type of the infection.

—After Mitchell, Humphreys, and Walker, 1932

that cases of that disease, though seemingly normal for many years, are capable of infecting healthy horses and that, apparently, any sort of vector capable of transmitting exceedingly small quantities of the specific virus may cause a fatal infection. A healthy horse tied and immersed up to the hocks for half a day in a pond suspected of being a reservoir of the virus, and prevented from drinking any of the water, suffered two outbursts of fever and died in twenty-three days. Another horse exposed in the same fashion for six hours sickened in seven days and died thirty-three days later. Experiments on cross infection between virus from western Canada and the Ottawa virus demonstrated significant differences between the two strains. The eastern virus infected horses already infected with western virus and *vice versa*. The investigation also refuted the theory that the fatigue of hard work is a contributing factor. The victims in question were lumber camp horses during the winter, and were at pasture and well cared for during the summer when the outbreak occurred.

cemia, plant poisoning, spinal meningitis, and swamp fever, perhaps generally accounted for by the irregularity of the exacerbations and their subsequent remissions



—After Mitchell, Humphreys, and Walker, 1932
Mucopurulent conjunctivitis of a subacute case.

¹Mitchell, Chas. A., Humphreys, F. A., and Walker, R. V. L., Division of Animal Diseases Research Institute, Hull, Que.: Equine Infectious Anemia, an Outbreak in the Ottawa Valley. Reprint from report of the Veterinary Director General of Canada, 1932, received Sept. 13, 1944.

if not also by deceptive clinical signs (edema, depression, petechiations, staggering) characteristic of other diseases. [Swamp fever can be diagnosed positively only by animal inoculation, so practitioners

NUTRITION

MATERIAL FURNISHED BY THE COMMITTEE ON NUTRITION

A Suggested Explanation for the Action of Mineral Elements on Nerve Irritability

M. J. CALDWELL, M.S., and J. S. HUGHES, B.S., M.S., Ph.D.

Manhattan, Kansas

VETERINARIANS are familiar with the effect of calcium on nerve irritability. In the last few years since calcium gluconate has been made readily available, it has become a common therapeutic agent. The fact that potassium, in small amounts, has just as specific an effect on tissue permeability and irritability as calcium, but in the opposite direction, is not so well known, although there is voluminous literature concerning the physiological action of potassium¹. Potassium is not used to any extent in that rôle as a therapeutic agent by veterinarians.

So far as the authors are aware, there is nothing in veterinary literature, and very little in any literature^{2, 3}, that offers an explanation as to why mineral elements produce such profound physiological reactions, or why certain ones are antagonistic to others. There are, however, some apparently unrelated facts in the fields of physical chemistry, physiological chemistry, and physiology which, when viewed together, seem to offer a reasonable explanation of the action of these mineral elements. It is the purpose of this paper to present this hypothesis in the hope that it may stimulate research which will lead to an understanding of the physiological action of the mineral elements.

One fact in physical chemistry that may throw light on this interesting problem is that soaps of monovalent ions produce

emulsions of oil and water of a type opposite to those produced by the soaps of the divalent ions².

Soaps of the monovalent ions, such as sodium and potassium, produce an "oil in water" emulsion; that is, an emulsion in which the oil is found in droplets surrounded by a continuous phase of water. Such an emulsion is a good conductor of electricity, since the continuous phase of water allows free passage of the ions which make up the electric current.

Soaps of divalent ions such as magnesium and calcium, on the other hand, yield emulsions of the "water in oil" type, in which the water occurs in droplets surrounded by a continuous phase of oil. This type of emulsion will not conduct an electric current because the continuous phase of oil will not allow free passage of electrically charged ions.

If a mixture of the soaps of the monovalent and divalent elements is employed as the emulsifying agent, the ratio of the two will determine the type of emulsion obtained, and hence, its conductivity.

One fact, from the field of physiological chemistry, that may contribute to the solution of the problem is that nerve tissue contains a very high percentage of lipin or fatlike material which is capable of becoming one phase of an emulsified system. Irritability seems to be associated with the lipin content of the tissue. A fact in physiology that must be considered is that a nerve impulse is always accompanied by an electric current known as the action current. In fact, the action current is an integral part of the nerve impulse and is probably associated with the propagation of the impulse along the nerve.

Presented before the eighty-first annual meeting of the American Veterinary Medical Association, Chicago, Aug. 22-24, 1944.

Contribution No. 296, Department of Chemistry, Kansas State College, Manhattan.

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Taken together these three facts—the relation of mono- and divalent element to the type of emulsion produced, the high percentage of lipin in nerve tissue, and the action current associated with the nerve impulse—seem to offer a logical explanation as to why the mineral elements influence irritability, and why the action of the monovalent element is antagonistic to the divalent.

In normal nerves, the permeability or conductivity through the tissue is so adjusted as to give the proper degree of irritability. Probably the ratio of the mono- to the divalent mineral elements combined in the same tissue has much to do with this permeability or conductivity. If this ratio is disturbed, the permeability and hence the ability of the action current to flow will be altered⁴. If the organization of the lipin and water in the nerve behaves in a manner similar to the action of an emulsion *in vitro*, then conductivity and irritability would be increased if the ratio of the minerals were altered so as to give an excess of the monovalent elements, sodium and potassium, over the divalent elements, calcium and magnesium. Irritability should be decreased if the ratio were altered in the direction of increasing the divalent elements in proportion to the monovalent elements.

Hypoparathyroidism and milk fever are two well-known pathological conditions characterized by increased irritability associated with a decrease in blood calcium. Just the opposite of this is illustrated in a less-known condition in human beings (familial periodic paralysis), where a drop in potassium results in paralysis^{1, 3}. Just as the typical milk fever symptoms can be relieved by injecting calcium, so this paralysis can be relieved by ingesting potassium⁵.

It is interesting in this connection that muscular exercise, which results in the passage of potassium from the muscles to the plasma, has the same effect as ingesting a potassium salt⁶. It is the experience of persons afflicted with this type of paralysis that they can prevent the onset by exercising as soon as they recognize the early symptoms.

The effect of muscular activity on irritability is also manifested when a cow, which seems to be normal, is thrown into typical milk fever by exercise. The same phenomenon is sometimes encountered in

grass tetany. The animal seems normal while grazing but develops tetany while being driven. It is not uncommon for steers, taken from wheat pasture, to develop tetany while being loaded into cars. A possible explanation for this influence of muscular action on irritability is that the increased potassium thrown into the blood from the muscles is sufficient to upset the mineral balance in the nerve tissue. If this balance is already displaced in the direction of too small an amount of monovalent element in proportion to divalent, then muscular exercises will tend to restore the normal balance and paralysis will be prevented. If the balance has been shifted in the direction of too much monovalent element in proportion to the divalent element, then the muscular exercises will push the balance farther from normal, possibly resulting in tetany.

Pasture grasses on which grass tetany may occur are often very high in potassium⁷. The potassium content of wheat grass will sometimes run as high as five per cent on dry basis. The potassium content of this grass increases to a peak near the end of the fall growing season, drops during the dormant winter period, and again reaches a peak during the spring growth, just before the plant begins to joint. The time of greatest danger from grass tetany, often called wheat poison in regions where wheat is pastured, coincides with the time that the potassium content is the highest. This suggests that the high potassium content of the feed may be one factor in causing grass tetany. In many cases of this disorder, there is a drop in magnesium content of the blood. Grass tetany occurs more frequently in fresh dairy cows than in dry cows or beef cattle. The condition is relieved by the injection of calcium gluconate just as the symptoms of typical milk fever are relieved by the injection of this compound. The hyperirritability in these two conditions, milk fever and grass tetany, seems to result from an imbalance in the minerals.

The mineral imbalance of milk fever may result from the rapid withdrawal of calcium by the mammary gland, while the imbalance in grass tetany may result from an increase in potassium coming from the high potassium content of the feed.

A slight elevation of potassium in the tissue causes hyperirritability; greater ele-

vation of this element blocks the nerves. This might be explained on the basis that a slight shift in the mineral ratio would increase the permeability just enough to accentuate the action current to such an extent as to facilitate the propagation of the nerve impulse. If the ratio of monovalent elements to divalent elements is pushed beyond a certain point, the permeability becomes so great that the nerve is no longer capable of carrying impulses. For want of a better idea, one might say the action current is short circuited. If this purely hypothetical explanation is true, it would account for the fact that the early stages of milk fever may be characterized by hyperirritability while the later stages of milk fever may be characterized by hypoirritability. Just as too wide a ratio due to large increases in potassium will cause hypoirritability, so too wide a ratio due to the very low calcium might be expected to give the same results.

The hypothesis that nerve tissue is an emulsion-like organization of lipin and non-lipin compounds, which responds to the action of mono- and divalent elements in a manner similar to the response of water and oil emulsions *in vitro*, seems to be in accord with many of the known facts concerning the influence of minerals on irritability. Whether or not this hypothesis is true, it suggests that all the mineral elements contained in a tissue should be studied when such pathological conditions as milk fever and grass tetany are being investigated. Studies thus far reported have been concerned primarily with calcium, magnesium, and phosphorus⁸⁻¹⁰.

The four elements which are most likely to be involved in controlling irritability are the two monovalent elements, sodium and potassium, and the two divalent elements, calcium and magnesium. Of these four elements, potassium and magnesium should receive special attention. Sodium and calcium are found in relatively small amounts in tissue in comparison with the amount in the blood plasma. Potassium and magnesium, on the other hand, are found in relatively much larger amounts in the tissue. It is the element within the nerve tissue which influences irritability and not those in solution in the plasma. Accurate information concerning the variations in the amounts of these elements in relation to changes in irritability should help in

understanding the part played by these elements in the control of irritability. Such information will also give the practitioner a clearer understanding of the function of these elements when used as therapeutic agents.

References

- ¹Fenn, W. O.: The Role of Potassium on Physiological Processes. *Physiol. Rev.*, **20**, (1940) 377-415.
- ²Clowes, G. H. A.: Protoplasmic Equilibrium. *J. Phys. Chem.* **20**, (1916): 407-450.
- ³Hughes, J. S. and King, H. H.: Physico-Chemical Basis of Psychic Phenomena. *Sci.*, **57**, (1923): 590-591.
- ⁴Hall, J. Lowe: The Sodium-Calcium Balance as a Function of Nerve Excitability and Cell Permeability. *Kansas Acad. Sci.*, **32**, (1929): 26.
- ⁵Herrington, M. S.: Successful Treatment of Two Cases of Familial Periodic Paralysis with Potassium Citrate. *J. Am. Med. A.*, **108**, (1937): 1333.
- ⁶Mitchell, J. K., Flexner S., Esdell, D. L.: *Brain*, **25**, (1902): 109 Taken from Fenn's Rev., Ref. 1.
- ⁷Miller, E. C.: A Physiological Study of the Winter Wheat Plant at Different Stages of Its Development. *Kansas Agric. Exper. Sta. Tech. Bull.* **47**, (1939).
- ⁸Sjollem, B.: Nutritional and Metabolic Disorders in Cattle. *Nutr. Abstr. and Rev.*, **2**, (1932): 621-31.
- ⁹Allcroft, W. M., and Green, H. H.: Blood Calcium and Magnesium of the Cow in Health and Disease. *Biochem. J.*, **28**, (1934): 2220-2228.
- ¹⁰Hibbs, J. W., Krauss, W. E., Monroe, C. F., and Sutton, T. S.: Blood Changes in Normal and Milk Fever Cows at Parturition. *J. of Anim. Sci.*, **3**, (1944): 437-438.

Biological Products Guarded by BAI

More than 5,000,000 inspections and 70,000 rejections of animals intended for use in the production of veterinary biological products were reported, last year, by the U. S. Bureau of Animal Industry.

The Bureau supervises the technical procedures in commercial establishments, licensed under the federal Virus-Serum-Toxin Act, for the production of serums, vaccines, diagnostics, and similar products used in combating animal diseases. Its control over the quality of such biological products, during the fiscal year ended June 30, 1944, included 8,270 potency tests and 10,178 purity tests of anti-hog-cholera serum and hog-cholera virus; supervision over the production of more than 2,500,000,000 cc. of those products; similar supervision over 2,500,000 cc. of antitoxins, and 300,000,000 cc. of bacterins, toxoids, diagnostics, and other products. The Bureau's inspectors supervised the destruction of 175 batches of brucellosis vaccine found to be of unsatisfactory quality. Other duties included control over imports and exports of veterinary biological products.

EDITORIAL

Dr. Jean Paul de Marat, Veterinary Surgeon

As a going affair, the veterinary profession is young—in the manner of speaking, a brat of the nineteenth century in short pants. Yet, he who will dig around to find colors for his palette will be able to paint quite a colorful sketch. For instance, Dr. V. C. Pahlman, Puyallup, Wash., in one of his forays into the Land of Unknowns, discovered that Jean Paul de Marat (1744-1793), bath tub victim of Charlotte Corday on July 11, 1793, was a veterinarian. Says Marquis de Lafayette's biographer, Andreas Latzko (1936):

Dr. Marat, veterinary surgeon to Comte d'Artois, had struck up an acquaintance with his grooms as well as with his horses.

The Count was a brother of the ill-fated Louis XVI and, therefore, one of *les grands seigneurs* marked for the guillotine. Marat, his alleged veterinary surgeon, was head of the Jacobins until his assassination, and his successor was none other than Antoine-Francois de Fourcroy, professor of general physics and chemistry at the *École Vétérinaire d'Alfort* (Veterinary School of Alfort). As the methods of the Jacobins became atrocious in rescuing the down-trodden, it is natural to want Marat's name stricken from the roster. What are the facts?

According to our library, Dr. Marat was a native of Switzerland and "a physician who had never taken the pulse of a patient." His veterinary connections were not remote. In the 1780's, graduates of Alfort were few—mostly middle-aged horseshoers—and the school itself was waging a precarious fight for its very life. Its budget was cut to the bone; Director Philibert Chabert was imprisoned (Dec. 16, 1793) under the law of suspects; Comte Maurepas, one of the King's functionaries, recommended that Alfort be abolished "as no advantage to the state." Anatomist Charles Vial de Sain-Bel, founder of veterinary education in English-speaking countries,

fled to London to save his neck; and Marat's successor, Fourcroy, is held responsible for the execution of the world-famed chemist, Antoine Lavent Lavoisier (May 8, 1794). If these presents are not sufficient to connect Marat with the contemporary veterinary service and the struggle of Alfort to keep afloat, neither Lafayette's biographers nor veterinary history writers can dodge such figures as Talleyrand, Daubenton, Maurepas, Necker, Marat, and others after them who besides meddling with the Alfort faculty, made life miserable for General Lafayette from the time of his arrival at Valley Forge in 1777 until his death in 1834. His eternal fight for constitutional government and universal franchise, like the democracy of the Alfort founders, aroused the extreme wrath of the Right as well as the vengeance of the Left. The early history of veterinary education was pretty much a fight between the arrogance of Marie Antoinette and the atrocities of the mob. What a paradox! In 1945, the big nations of the world meet in California hopeful of finishing the job Lafayette started 168 years ago at the cost of lifelong grief, disappointment, long imprisonment and confiscation of his private fortune. At heart, the early veterinary educators of France were Girondists (moderate republicans), too moderate for the Jacobins (extremists) and too radical to suit the King's Court.

An afterthought to be freshened up is Vial's flight from Paris to London (1788) during Dr. Marat's regime, for that episode is material for a *Tale of Two Cities* not found in the libraries—the tale of the founding of formal veterinary education in the language we speak. The answer to the direct question "What are the facts?" is that Marat was a quack veterinary surgeon, whose atrocities accomplished something he could not have predicted—a veterinary profession. It's an ill wind. . . .

Comment on "How Many Is Too Many"

Dr. E. M. Nighbert (K. C. V. C. '02), retired field parasitologist of the BAI, basking at Cantonment, Florida, never lost the knack of keeping score on the march of the veterinary profession. He writes:

The editorial "How Many is too Many Veterinarians" in the March [1945] issue of the Journal is most thought-provoking to an oldtimer like this reader. I agree 99 and 99/100 per cent. I was agent, as a student, for the *American Veterinary Review* fifty-one years ago. I have seen the Review grow into the JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION of 1945, the periodical that has made fine headway and brought the profession, after a hard uphill pull, to its present position where the profession may see ahead and plan for the future.

I don't know how many is too many but I will say that "too many" is not enough for "various and excellent reasons" as an old colleague used to say. Maybe the world veterinary situation came into being like the old time circuit-riding preacher explained to his congregation:

You get religion when you don't want it.
If you want it you can't get it. When you
get it you don't know it. If you know it
you haven't got it. When you get it you
can't lose it. If you lose it, my brethren,
you never had it.

To be serious, there is plenty for all veterinarians to do to safeguard the present and future worthiness and activities of the profession. I would like to see some lay publication made available for general use with the public.

With kind regards and best wishes.
S/E. M. NIGHBERT

Comment.—The publication of a veterinary periodical for general circulation has been considered as an additional project of the Association for some time but is held in abeyance just now for reasons too generally known to mention.

Who's Who in the Canine World?

Whom shall we hail as dogs' best friends in this country? That is the question Gaines Dog Research Center asks American veterinarians, and others, to answer. In other words, whose portraits shall be hung in "Dogdom's Hall of Fame" that is being established at the Gaines research headquarters in New York City?

Two types of nominations for the honor are solicited: One for men or women who have made noteworthy contributions to the welfare of "man's best friend," and another of dogs famed for exceptional deeds in the service of mankind. According to a note from Executive Secretary Harry Miller, the particular object is to honor persons and dogs of the present century, preferably the living. In addition to the portraits, a "Golden Book" for the citations will be maintained as an adjunct of the exhibit.

Veterinarians are invited to choose candidates for this hall of fame. Nominations should be addressed to Mr. Miller, c/o Gaines Dog Research Center, 250 Park Ave., New York City. The project has incomputable merit as a tribute to man's debt to domestic animals.

Veterinary Corps Officers Retired from Regular Army

Elsewhere in this issue, we are happy to present brief biographical sketches of six officers who have completed the term of service in the Veterinary Corps of the Regular Army. These men have been retired since the outbreak of the present war. A similar sketch is presented for a seventh officer who will be retired soon.

Individually, and as a group, they have been faithful workers and capable leaders. They have been highly important in the upward march of the Veterinary Corps, a march which has developed in the United States Army the most outstanding Veterinary Corps in the world.

Every veterinarian will be grateful for what these men have done for the profession, and will appreciate the value of their service in establishing favorable public relations. We must be reminded, however, that their service has lifted all of us to a more conspicuous place, for which we owe them and the profession a debt that can only be paid by strict adherence to the high ideals which they have set for us.

For the harm suffered by farmers, from time to time, on account of surplus crops, Sam Guard's Round-Up in *Breeder's Gazette* recommends more and better farm animals to convert cheap feed into higher-priced meat.

Health Service Patterns for Man and Animals

Health, the greatest of human commodities, is not protected by a universally used pattern throughout the world or within given regions or countries; nor is health as a commodity uniformly appraised. Make-shift ways, born of public indifference, fail to obtain optimum results in spite of ambitious programs, and inasmuch as disease is no respecter of geographic boundaries only a global pattern will achieve the desired end. As expressed by Dr. George C. Dunham (*Am. J. Pub. Health*, Feb. 1945), "public health work must be based upon coöperation as well as upon conquest." In no place is the wisdom of that remark more apparent than in the fight against the diseases of animals. *Conquest*, expressed in the veterinary field by the more forceful term *eradication*, is hard to achieve where the coöperation of all concerned is lacking. On that account, knowledge of disease and methods of proceeding against it must be preceded by a planned educational program on elementary physiology and pathology in the public schools. Dr. F. C. Hedlich (*Yale J. Biol. and Med.*, Jan. 1945), in an article titled "The Patient's Language", exposes the failure of general education in that respect by testing the knowledge of 100 native-born patients whose education bordered around high school status. Words for which definitions were asked ranged within the common terms of a medical practice, *e. g.*, *infection, tuberculosis, syphilis, Wasserman reaction, spine, spinal fluid, nerve, nervous shock, paralysis, lesion, tumor, metastasis, prognosis, pathology, organic, functional, psychogenic*, and so on up to sixty words. The conclusion reached was that (and we quote) "The ignorance and the confusion as regards medical terms make one wonder whether our educational system fulfills its function of teaching the population certain minimal requirements regarding health and disease." It should be told in passing that this conclusion springs from the Department of Psychiatry and Mental Diseases, School of Medicine, Yale University. The investigation showed (as the author suggests) that investigation of the situation by educators, public health officials, and physicians has perhaps been too long postponed. The interest here lies in the fact that ignorance of animals, animal products, and animal health is felt also

in promoting patterns for the application of veterinary science. An eighth grade teacher in a large American city once reported that members of his class thought that milk was made down at the grocery store, meaning, in effect, that knowledge of the animal kingdom's place in the sun is beautifully by-passed in the school books, ignorant as the general population must forever remain as to the source of its subsistence until the salient fact of the biologic sciences is taught in the public schools, systematically, and with public welfare as the motive. While general education may not stoop to medical science for direction, it is not unreasonable to ask why health is but a fringe of its curriculum.

"Why Don't We Eat More Poultry Meat?"

Out of the field of experience, Frank Priebe (*Poultry Tribune*, April, 1945) spars with the answer to this lively question with whole-hearted sympathy for the poultry industry. He wonders that people eat as much chicken as they do in view of the difference between the catchy taste of the freshly dressed live chicken of old and the viscera-and-all carcass of the market today, which has lost all the relish that once made the chicken dinner a treat for any occasion.

In the author's words, "Every time I go to the butcher shop and see chickens thrown in a case with feet sticking out in all directions and head hanging limply, and I see the butcher drag one out by the heels and dangle it in front of the customer, I wonder that people buy as many chickens as they do." For obvious reasons, the hygienic factor is omitted, but summed up, the article is nothing less than another prediction that within a few years poultry, like other meat animals, will have to yield to evisceration and inspection at the time of slaughter in the interest of public health and, simultaneously, to that of the poultry industry itself. What more could have been said in support of the Association's Committee on Food Hygiene, which has taken energetic leadership in the movement to abolish the marketing of un-eviscerated poultry?

CURRENT LITERATURE

ABSTRACTS

Duck and Turkey Eggs in Vaccine Production

The use of duck eggs in the place of hen eggs for preparing typhus vaccine increases the yield five times, or 100 to 200 cc. per egg harvested on the seventh to the eighth day after inoculation. In a high percentage of yolks, stained smears show an almost confluent sheet of rickettsias which is far beyond any result obtainable from hen eggs. Another advantage is the higher dilution of residual proteins which renders subsequent processing easier. Protection tests in guinea pigs were equal to vaccine made from hen eggs. Similar results were obtained from turkey eggs. The eggs are incubated at 102 F. in completely humid atmosphere.—[A. P. Berkowitz, *Duck and Turkey Eggs for Large Scale Preparation of Typhus Vaccine*, *South African J. Med. Sci.*, 9, (Aug. 1944): 109. *Abstr. J. Am. Med. A.*, 127, (Feb. 24, 1945): 492.]

Epizootic Lymphangitis of Solipeds

The farcy-like disease of solipeds of Oriental countries known as epizootic lymphangitis has been observed by the Veterinary Corps in the North African theater. American veterinarians on duty in the Philippines at the turn of the century described the disease at length in official reports, and pointed out how easy it would be for a novice to mistake it for glanders. Several cases were recognized in the French Army on the western front in World War I, where it was said to have been brought in by private mounts from Indo-China. American veterinarians who had seen service in the Philippines spotted the disease at once. It was promptly stamped out, and was never again seen in any of the allied armies.

The disease is caused by an ovoid, gram-positive organism named *Saccharomyces* (or *Blastomyces*) *farciminosus*. In North Africa only the local form was seen. The disease appears in the form of one or more chains of superficial, pea-sized nodules, quite evenly spaced along lymphatic vessels, which soon turn to pustules and then to ulcers. The sites of predilection are the breast, shoulder, forearm, and neck. The course is chronic. Recoveries from intensive surgical treatment and iodide medication are not rare although re-

lapses after several months of good health occur. As a rule, the victim slowly emaciates and dies.

The treatment is mainly surgical—extirpation of the lesions. Iodides are recommended but may be of doubtful value. Good hygiene is essential: sunlight, exercise, good rations. It is better, however, to kill the animal and dispose of its carcass properly, as the presence of an affected animal is a danger to others. The diseases from which it may have to be differentiated are ulcerative lymphangitis, glanders, sporotrichosis, and contagious pustular dermatitis. Glanders, however, is the only clinically similar disease, and that is quickly excluded by the mallein test.—[Major Hendrik Vessluis, V.C., and Capt. Bernard E. Foote, M.C., 15th Medical General Laboratory and Headquarters, Peninsular Base Section: *Epizootic Lymphangitis*, *Med. Bull., North African Theater of Operations*, 2, (Nov. 1944): 134-135.]

"The Tamest of the Tame"— Meaning Chickens

"It is a long flight from the jungle fowl [of 5,000 years ago] to the domesticated, modern, 300-egg hen," is the way the author opens an admirably conceived thesis on our \$2 billion poultry industry.

The transition of the prodigious 300-egg hen of 1945 from the 22- to 26-egg clutches of the jungle fowl of prehistoric Asia stands out as one of man's great achievements in the husbandry of domestic fauna. In the perspective of time, one sees that the primitive hen of the wilds, skirting the human habitats, was not only easy to tame but was also quick to respond to the benefits of domesticity, during the period that man was transcending from hunter to farmer to townsman, that the barnyard hen of today must be credited with having played a cardinal rôle in the affairs of her keepers through incomparable production of human subsistence, all the way from the era of unknown history up to the remarkable poultry and egg crops of World War II.

The romance of the hen begins—for documentation—with *Gallus bankiva* of eastern and southern Asia (India, Burma, China, Malay, the Philippines) and it permeates every niche

of Occidental development, in the guise of creative breeding, feeding in lieu of foraging, hygienic housing instead of outdoor life, and the mastery of disease through scientific research.

Once dubbed a trifling sideline or job of the shiftless, poultry and egg production have mounted to the dignity of a noteworthy human undertaking, both in the spheres of science and economics. Notable scientists are engaged in its promotion. Governments, colleges, and research laboratories have recognized their responsibilities in connection with poultry husbandry and diseases, and, to a lesser extent, with the sale of poultry products [and sanitary inspections]. Other factors in the development of this major industry are poultry shows, artificial incubation and brooding, the shipping of baby chicks, feed distribution, scientific feeding, transport and storage refrigeration, and the discovery that the hen's egg is a marvelous food, containing 12 of the 16 elements of the human body—all wrapped up in a 2-ounce package.

In 1943, there were 925,652,000 chickens in the United States and they laid 4,516,000,000 dozen eggs—total value \$2,322,000,000. The boasted billion-dollar industry of 1939 has more than doubled.—[Evan L. Stubbs, V.M.D.: *The Tamest of the Tame. The General Mag. and Historical Chron.*, Autumn (1944) issue. Pub. by U. of Pa. and General Alumni Society.]

The Future of Science

No one can forecast the future of science. As in all times past, prophetic theses must always seem fantastic. What was true of Aristotle, Galileo, Newton, and others who wrote bright pages of science, remains true now. In 1890, no one forecast the x-ray, the insect vector, the motor car, syntheses, and other scientific developments that profoundly changed the world. From the scientists' viewpoint, all aspects of the different sciences are interrelated, and have been so related since the decline of Greek science and philosophy and the ascendancy of the Arabs during the first centuries of the Middle Ages, when they overran the Occidentals and erected mosques, libraries, and the universities where the remnants of ancient science again bloomed, developed, and, in effect, set liberty on the march for all the world by holding steadfast to its traditions. Quoting: "In these tragic hours, the love of liberty more than luxury is being born in human hearts. . . as it was being born throughout Europe in the most dreadful days of the French Revolution." The author compliments the foundations in operation in this country, the government's research programs (reminder of Beltsville and the state experi-

ment stations), and their matchless contributions to human welfare. Science pertaining to vital national resources, national defense, pests and infectious diseases should be administered under the watchful eyes of scientists to prevent the dry rot of political service.—[F.R.M.: *The Future of Science. A.A.A.S. Bull.*, 4, (Feb. 1945): 9-11.]

Sulfonamides Inhibit Egg-Shell Formation

Some sulfonamides, when fed to hens, cause them to lay eggs without shells. This action is attributed to the inhibition of the enzyme, carbonic anhydrase, catalyst of the reaction $\text{H}_2\text{CO}_3 = \text{CO}_2 + \text{H}_2\text{O}$. There is normally a high concentration of this enzyme in the oviduct of laying hens. Its function, which appears to have been proved, is the formation of calcium carbonate in the shell. While the action has nothing to do with the antibacterial action of sulfonamides, it is believed to be a starting point for the study of their dynamics.—[Sulphonamides, Eggs and Enzymes. *Vet. Rec.*, 57, (Jan. 13, 1945): 23.]

BOOKS AND REPORTS

Trauma in Internal Diseases

Collecting facts, theories, and opinions on the vagaries of internal injury from violence, especially the more chronic damage leading to lawsuits, was never before undertaken. In the face of the ground covered by this book, it would seem that, in so far as court testimony is concerned, most all organic diseases can be pinned upon traumatically acquired injury without straying beyond the bournes of logical etiology, what with the convenient contention that a given trauma can and obviously does arouse latent flora or degeneration of an organ damaged by external violence. Not even metabolic disorders (diabetes, pernicious anemia) escape. On the witness stand, physicians have had to rely upon the scattered material now brought between covers.

Though off hand the matter of trauma in internal diseases may seem academic only in veterinary medicine, it bears the thought that perhaps our prognoses in this connection have been too hasty. Moreover, in view of the mounting occurrence of accidental injury in small animals, the problem warrants our most intelligent attention. While the veterinarian has been mainly concerned over the immediate parenchymatous injury of his wounded subjects, the remote sequels have probably been passed over too lightly. That, at least, is the impression this book will leave in the mind of the veterinary reader, notwithstanding that it was written for the physician and surgeon exclusively.

The author attempts to point the finger less erringly at the given trauma as the cause of the given disease—an admittedly difficult thing to put into written words. Seems like a more or less successful attempt to make the expert witness just that before the judge and jury, or should one say a noteworthy effort to bring honor to expert testimony in the medical field.—[*Rudolph A. Stern, M.D., Assistant Attending Physician, City Hospital, New York City: Trauma in Internal Diseases. 575 pages. Cloth. Gruen and Stratton, New York. Price, \$6.75.*]

Bureau of Animal Industry Report for 1944

This report conforms with the growing dimension of America's veterinary problem. As if to impart the more practical information needed to meet wartime needs, the material overlaps the usual ground. It's the story of the principal diseases which harass the country's livestock and the methods in force to master them. The Chief's report for the fiscal year ending June 30, 1944, paints a true picture of what the veterinary service has to do to enable the American farmer to comply with the government's accelerated program of animal production. To those who can read between the lines of such a document, the animal-disease potential is a veritable ambush kept down by scientific research, rigid discipline, and vigilant police work, under the type of generalship which has won the admiration of science and industry, in peace and in spite of the drain of a global war. Would that the general population could measure the extent to which their rations are ambushed by the lurking plagues of farm animals: hog cholera, tuberculosis, brucellosis, swine erysipelas, salmonellosis, bovine mastitis, metazoan parasitisms and other enemies of higher life that the BAI and its state collaborators keep in check through science and vigilance. The report is crammed with utilitarian information, useful in the every day work of a field veterinarian and a record of contemporary achievements. As to polemical brucellosis, the Chief must be complimented for laying out plans for a universal frontal attack—for trying to turn chaos into order.—[*Annual Report of the United States Bureau of Animal Industry, 1944. Edited by A. W. Miller, D.V.M., Chief, Bureau of Animal Industry, U.S. Department of Agriculture, Government Printing Office, Washington, D.C.*]

Radiology in Canine Practice

While radiography is not new in canine medicine, the writing of a "first" on so important a subject requires both courage and ability and, inasmuch as expert technologists in that special field are not numerous, one may look in vain

for a competent critic of this book, meaning that both basic training and experience in the routine of practice have to be coupled to yield material of value. On that account, the veterinary profession is indebted to the author and his workshop, the Angell Memorial Animal Hospital of Boston, for publishing the first textbook on veterinary radiology in English.

As the author points out in his preface, much of the text is a reprint of a series of articles published in the *North American Veterinarian* since 1937, which are here whipped into form for the edification of student and practitioner. In the introductory chapters, the novice is taken through the basic principle of radiographic work, the fundamentals of the x-ray, the interpretation of shadows, the equipment, the facilities required for the necessary installation, and the technique of protection, exposure, positioning and immobilization. Beyond these are the chapters on bones and joints, soft (organic) tissues, and foreign bodies, each broken down into revealing headlines and channelled in the practical direction. It does not require experience in radiology to sense the abundance of experience written into the paragraphs of this book. It has the earmark of experience obtained in the line of duty. None but a veterinarian surrounded by opportunity could have written it.—[*Gerry B. Schnelle, D.V.M., Assistant Chief Veterinarian, Angell Memorial Animal Hospital, with a foreword by Merril C. Bosman, M.D., Professor of Roentgenology, Harvard University, School of Medicine: Radiology in Canine Practice. 336 pages. Cloth. Well illustrated. The North American Veterinarian, Inc., Evanston, Illinois, 1945. Price, \$5.00.*]

Veterans' Discharge Lapel Button



—U. S. Army Signal Corps Photo

Everyone should become familiar with, and recognize the significance of, this emblem when worn by honorably discharged members of the military forces. They have already served their country.

THE NEWS

University of Havana Confers Honorary Degree on Prominent Veterinarians

In the summer of 1944, letters were received from the University of Havana, Cuba, advising that four veterinarians in the United States, and one in Mexico, had been designated to receive the honorary degree, *Profesor Honoris Causa*, from the School of Veterinary Medicine, University of Havana. The more personal and explanatory of the letters was signed by Dr. Julio San Martin, and as it was written in English, is quoted here in part:

It is a great pleasure to me to inform you [Dr. W. W. Dimock] that the High Council of the University of Havana has approved the resolution of the Veterinary Faculty, passed a few months ago at my move, and conferred upon you the Degree of *Profesor Honoris Causa* of our Veterinary College, in a special session held yesterday. Drs. John R. Mohler, Adolph Eichhorn, Nelson S. Mayo, and Sarvide, the latter of the University of Mexico, have also been accorded the same distinction.

Our faculty feels highly honored in counting you in its Roll of Honor and much

forget the fact that you were the first organizers of the Veterinary Service of the Department of Agriculture in Cuba.

I need not state that I am personally highly satisfied and honored by being the initiator of the motion that has culminated in the resolution of the University Council, which will not only serve the purpose of doing justice to a group of deserving and hard-working scientists, but also to strengthen the links of friendship that have long since existed between American and Cuban veterinarians and that should exist between the members of the Veterinary Profession of the whole American continent as a postwar achievement.

A more formal and official, yet equally gracious letter, was received from the dean of the School of Veterinary Medicine. A third was from the rector of the University, whose official statement came from the University as a whole.

The five veterinarians designated for the honor were Drs. John R. Mohler, N. S. Mayo,



Profile of Escuela de Medicina Veterinaria, Universidad de la Habana

privileged by being able to pay a public tribute of appreciation of the great work performed by you in behalf of the progress of our profession in America, throughout a long and fruitful life devoted to the teaching of Veterinary Science, to the safety and welfare of mankind and to the better interests of the livestock industry. In your case and that of Dr. Mayo, we cannot

Adolph Eichhorn, W. W. Dimock of the United States, and Dr. Emanuel H. Sarvide of Mexico.

Later, word was received that the investiture ceremonies would be held early in December. Unfortunately, because of a previous commitment, Dr. Mohler was unable to go to Cuba. The other three veterinarians of the United States, Doctors Mayo, Eichhorn, and Dimock,

and Dr. Sarvide of Mexico, were present for the ceremonies.

The investiture ceremonies were held in the *paraninfo* of the University of Havana in a solemn session presided over by Dr. Clemente Inclan Costa, the new rector of the Cuban university. Dr. Costa opened the exercises in the name of the University of Havana, the Veterinary College, and the Republic of Cuba. His simplicity, dignity, and gracious manner would inspire confidence and respect at any gathering in the world. A large band played the Cuban, American, and Mexican national anthems. On the rostrum were the rector of the University, the Secretary of Agriculture, and the faculty of the School of Veterinary Medicine, all in academic costume. The auditorium, with seating capacity of 1,000 or more, was well filled with members of the faculty, students, friends, and families of those assembled, as well as veterinarians of Havana and other parts of Cuba, some of whom had earned their degree, D.V.M., in a veterinary college in the United States.

The rector, Dr. Costa, next called upon the dean of the School of Veterinary Medicine, Dr. Murillo, who, briefly and in well-chosen words, made the introductory speech, explaining the purpose of the exercises from the standpoint of the veterinary college. Next, Dr. Julio San Martin was introduced. He read the citations which covered very completely the life work and accomplishments of each of the five veterinarians who were to receive the honorary degree.

Dr. San Martin is a gifted writer and fluent speaker, and to him is due special credit for the time and effort which he devoted to the preparation of each citation. At the conclusion of the reading in each case, the recipient of the honorary degree rose, and walked around in front of Dr. Costa, the rector, who then presented the official medal of the University, a magnificently wrought bronze, inlaid with light blue enamel, hanging the medal about the neck of the recipient by the heavy gold cord from which it was suspended. Then a diploma was presented and the rector of the University conferred the degree *Profesor Honoris Causa*. Dr. John R. Mohler, retired chief of the Bureau of Animal Industry, who was unable to be present, was granted the degree *in absentia*.

Following the granting of the degrees, Dr. N. S. Mayo, in his usual good form, eloquently expressed the appreciation of the veterinarians of the United States for the honor extended to those receiving the degree, and complimented the University of Havana on the progress which the School of Veterinary Medicine had made during the recent years. He expressed our approbation of the new and well-equipped buildings for housing the School of Veterinary Medicine, the fine laboratories, operating rooms, library, and the well-balanced corps of

instructors. Most gratifying and promising of all was the enthusiasm, vision, and perspective of the members of the teaching staff and their wholehearted determination to make the School of Veterinary Medicine, of the University of Havana, second to none in the world. Dr. Mayo thus voiced the wishes of all the candidates assembled for the uninterrupted success of the School of Veterinary Medicine.

Following Dr. Mayo, Dr. Sarvide of Mexico, speaking as the sole representative of Mexico, expressed his personal appreciation for being the one chosen to receive the honorary degree, and gave credit to all the veterinarians of the Republic of Mexico who have supported him in his work in the diverse subdivisions of the field of veterinary medicine; thus a special honor, though given to one, gave full credit to all.

At the conclusion of the exercises, the group went to the Hotel Nacional for luncheon. The good food, the good wine, the good company, and the brilliant conversation of the hosts could only result in an occasion that was enjoyed, appreciated, and long to be remembered.

On the day preceding the ceremonies, a luncheon, or breakfast, was held at the Army Remount Breeding Station near Havana. A sumptuous meal was served, which, as a gastronomic feast, was luxuriated in by all, especially by those who had not had the pleasure for many years, of partaking of the national dishes of wholesome food prepared with a flair and flavor unsurpassed or unapproached anywhere.

Following the luncheon, the animals maintained at the Remount Depot were inspected, including brood mares, colts, and stallions. Many of the brood mares were Arabians. Among the stallions were Thoroughbreds, Morgans, Arabians, and Cubans; also a rather unusual animal of special cross which, if memory can be trusted, was bred in Mexico. Mounted upon this stallion especially trained in fancy steps under the saddle, the riding master gave an interesting exhibition. The agricultural experiment station at Santiago de las Vegas, where Dr. Mayo and Dr. Dimock worked many years ago, was also visited.

Suggestions for Aiding Development of Veterinary Service in Certain States

Dr. H. L. Foust, chairman of the Special Committee on Postwar Planning, has submitted the following statement, representing an action taken at the meeting of the Committee in Chicago in December, 1944:

The Special Committee on Postwar Planning has had occasion to consider several important factors in its study of the distribution of veterinarians in the United States, among them being the fact that there are relatively few

veterinarians in some of the so-called agricultural states, while in others having nearly comparable conditions of soil, number and value of livestock, there is a considerable number of veterinarians.

In its effort to determine the cause of this differential, the Committee has found that veterinarians were attracted to, or remained in, states where they could participate in the mass testing incident to the state and federal government projects of bovine brucellosis and tuberculosis control. For example, in one state, the practicing veterinarians are paid from public funds to test for these diseases, while in a neighboring state, there are no funds for that purpose. It was found that in the former state, there were approximately 700 veterinarians, while in the latter state, there was only a small part of that number. In fact, there are large blocks of counties in the latter state entirely without veterinary service. This situation suggests that funds be provided from some taxable sources within each state from which practicing veterinarians could be paid to participate in the public projects of animal disease control and eradication.

In a further geographical study of the distribution of veterinarians, it was noted that the livestock carrying capacity of some large areas in the United States is influenced to a great degree by certain climatological factors. For example (from a livestock viewpoint), an area may at one time be termed as marginal or better, while at another time, it might be submarginal. Assuming that it is important that veterinary service be available to the livestock owner at all times, it is suggested that, in states having marginal or submarginal areas, a plan be considered by the state veterinarian and other interested persons to subsidize veterinarians in those areas. In this connection, attention is called to the possibility that the U. S. Bureau of Animal Industry (on recommendation of the state veterinarian and the state U. S. Bureau of Animal Industry inspector in charge) would be able to commission practicing veterinarians on a *per diem* pay to test cattle for brucellosis and tuberculosis. This latter plan may be feasible in some marginal areas, assuming that the veterinarians employed would also have some income from private practice.

Proposed Amendment of Administrative By-Laws

One year ago, an amendment was submitted relative to the reorganization of the personnel and duties of the Committee on Education. At the annual meeting, the Executive Board recommended that the amendment be not adopted but reported that a subcommittee of the Board was to be appointed to redraft the proposal and submit it at a later date. This action of the Board was sustained by the House of Representatives.

The Committee appointed was Dr. Walter R. Krill, chairman, Dr. A. E. Cameron, and Dr. James Farquharson. After much study, a proposed reorganization of the Committee on Education has been drafted and will be submitted in the report which the committee will make to the Executive Board in August. Customarily, the proposal would not be published until after the committee makes its report; however, because of the interest in the matter and in order to avoid another year's delay in acting on the proposal, if approved by the Executive Board at the annual meeting, it has been agreed that the amendment be published in three consecutive issues of the JOURNAL in accordance with Section 3, Article XIII of the Administrative By-Laws. Following is the proposed amendment.

Amend Article XII, Section 1, "2. Committee on Education" so that it will read as follows:

2. Council on Education

1) *Personnel*.—The Council shall consist of nine members. Three of these shall constitute an executive committee of the Council and these members shall be elected by the Executive Board of the Association for a term of six years. The initial election shall be for two, four and six years, respectively, so that one member will retire and a successor will be elected every other year. Two members of the executive committee shall be members of the faculty of veterinary colleges accredited by the Association, one whose principal interest and training is in the basic or preclinical sciences, and the other whose interest and training is in the applied or clinical sciences. The third member shall be an active (general) practitioner of veterinary medicine.

The six remaining members of the Council shall be appointed by the President at the rate of one member per year, each to serve for a term of six years. Initially, the six members shall be appointed for terms of one, two, three, four, five, and six years, respectively, so as to provide thereafter for one annual retirement. One member shall be appointed from each of the following branches of veterinary science:

- a) Large animal practice.
- b) Small animal practice.
- c) Governmental service.
- d) Military service.

- e) Public health service (including meat and milk inspection).
- f) Veterinary education or research.

The Council shall annually elect its own chairman and secretary.

2) *Duties.*—All veterinary colleges accredited by the Association shall be inspected at least triennially by the executive committee of the Council and a written report of each inspection shall be presented to the Council for its consideration. This report shall deal with all matters which have a bearing on the efficiency of the institution, i.e., size and competence of the faculty, physical plant and equipment, financial support, teaching methods in both clinical and preclinical sciences, size of student body in relation to that of the teaching staff and the amount of clinical material available, and the facilities for post-graduate training of veterinarians. Following approval of the inspection reports by the Council as a whole, copies shall be sent to the deans of the colleges concerned.

The Council shall lend its assistance to college authorities in the realization of their objectives for progressive, higher educational standards.

The Council shall meet annually to consider reports of its executive committee, and for the consideration of any other matters which pertain to veterinary education. In its annual report to the Association it shall include a list of veterinary schools that are approved by it, and a list of those that have been inspected and found to be unsatisfactory. The Council shall draw up and publish a statement of minimum requirements for an approved veterinary school to provide a guide to institutions that are seeking approval. Upon request of such institutions, the Council may cause an inspection of the schools to be made by its executive committee. Reexaminations of such schools shall be made only when the Council has been convinced that deficiencies have been sufficiently corrected to warrant reasonable hope that the minimum requirements for approval have been attained. (See also page 317.)

Summary of the Suit Against Associated Serum Producers

(Continued from the April JOURNAL)

Following the opening statements on behalf of the prosecution and of the defendants (see p. 243 of the April JOURNAL) before Judge William H. Holly and the jury in the federal District Court, Chicago, the government presented its case on the several days from Tuesday, Feb. 6 to Friday, Feb. 9, 1945. The witnesses subpoenaed by the government to testify were the following:

Witnesses Called by the Government

Dr. Raymond C. Surface, director of laboratories, Fidelity Laboratories, Inc., Chicago, Ill.; Dr. Herbert P. Lefler, assistant manager, Fort Dodge Serum Co., Fort Dodge, Iowa; Mr. Clifford J. Donovan, office employee of the Columbus Serum Co., Columbus, Ohio; Mr. Samuel F. Russell, director of livestock marketing, Illinois Agricultural Association, Naperville, Ill.; Mr. Roy J. Venard, St. Louis, Mo., formerly bookkeeper for Corn Belt Serum Co. and Corn Belt Laboratories, East St. Louis, Mo.; Mr. Lawrence M. Burnette, assistant secretary, Allied Laboratories, Inc., Indianapolis, Ind.; Mr. Clifford R. Billings, office manager, The Grain Belt Supply Co., Omaha, Neb.; Mr. Ernest L. Boley, secretary, The Southwestern Serum Co., Wichita, Kan.; Dr. Claude M. McFarland, sales manager, Missouri Valley Serum Co., Kansas City, Kan.; Mr. Clay W. Stephenson, general manager, National Laboratories Corp., Kansas City, Mo.; Mr. Louis H. Ouren, secretary-treasurer, The Corn States Serum Co., Omaha, Neb.; Mr. John Swaim, president, Fidelity Laboratories, Inc., Chicago, Ill.

During the direct examination of these witnesses, the government attorneys introduced a number of exhibits consisting of copies of correspondence, articles and editorials in various house-organs of the defendant companies, and other statements purporting to show various aspects of the sales-to-veterinarians-only policy of the defendant companies and how the policy affected their operations and sales. Also introduced were exhibits relating to the formation, objects, officers, membership, advertising and publicity programs and meetings of the Associated Serum Producers, Inc., one of the defendant organizations.

The government rested its case on Friday afternoon, February 9, whereupon the trial hearing was adjourned to Monday, February 12, at which time the defense began its presentation of witnesses. Those who were called to testify on behalf of the defendants were the following:

Defense Witnesses

Dr. Edward A. Cahill, president, Allied Laboratories, Inc., Kansas City, Mo.; Mr. Murray S. Barker, manager, The Indiana Farm Bureau Serum Corporation, Thorntown, Ind.; Dr. Walter K. York, Indiana representative of Fort Dodge Laboratories, Monticello, Ind.; Mr. Carl Angst, treasurer, Allied Laboratories, Inc., and manager, Pitman-Moore Co., Indianapolis, Ind.; Mr. Frank V. Hawkins, secretary, Allied Laboratories, Inc., Indianapolis, Ind.; Dr. Thomas W. Munce, manager, Sloux City Serum Co., Sloux City, Iowa, a division of Allied Laboratories, Inc.; Dr. Edward B. Hollecker, president, Missouri Valley Serum Co., Kansas City, Kan.; Dr. N. D. Harwood, president, Patterson-Harwood Laboratories, Manhattan, Kan.; Dr. A. Kushner, president, The Johnson Serum Co., Topeka, Kan.; Dr. Guy G. Graham, president, Jensen-Salsbery Laboratories, Inc., Kansas City, Mo.; Dr. Daniel E. Baughman, president, Fort Dodge Laboratories, Inc., Fort Dodge, Iowa; Dr. William A. Hagan, dean, New York State Veterinary College, Ithaca, N. Y.; Dr. John S. Koen, veterinary inspector, U. S. Bureau of Animal Industry, Storm Lake, Iowa; Mr. Charles S. Greene, manager, Gregory Laboratory, Whitehall, Ill.; Mr. Fred J. Rathman, president, The Southwestern Serum Co., Wichita, Kan.; Mr. Thomas R. Furry, president, The Blue Cross Serum Co., Superior, Neb.; Mr. Robert M. Young, president and general manager, The Grain Belt Supply Co., Omaha, Neb.; Dr. James T. Burriss, president and general manager, The Columbus Serum Co., Columbus, Ohio; Dr. H. D. Bergman, dean, Division of Veterinary Medicine, Iowa State College, Ames, Iowa; Dr. R. R. Dykstra, dean, School of Veterinary Medicine, Kansas State College, Manhattan, Kan.; Dr. Myron F. Wallace, secretary-treasurer, National Laboratories Corp., Kan-

sas City, Mo.; Dr. Ren C. Jullen, president, National Laboratories Corp., Indianapolis, Ind.; Dr. Carl J. Norden, president, Norden Laboratories, Lincoln, Neb.; Dr. E. C. Jones, vice-president and sales manager, Norden Laboratories, Lincoln, Neb.; Dr. Anthony E. Bott, secretary-treasurer, The Corn Belt Laboratories, Inc., East St. Louis, Ill.; Dr. Amor C. Drach, vice-president, The Corn States Serum Co., Omaha, Neb.; Mr. Guy H. Williams, president, The Corn States Serum Co., Omaha, Neb.

Mr. Scott L. Barrett, sales manager, Fort Dodge Laboratories, Inc., Fort Dodge, Iowa, was present throughout most of the trial but, at the last moment, was prevented from appearing as a defense witness by illness in the family.

The defense rested on Thursday, February 15. There was no rebuttal by the government.

The stenographic transcript of the whole trial comprised over 1,200 typewritten pages, and the testimony of the government and defense witnesses over 800 pages. Since it is obviously impossible to give the space required for this amount of material in the JOURNAL, and since the closing arguments by the government attorneys and defense counsel summarize the essential points which both sides endeavored to make in presenting their cases, the JOURNAL is publishing in this issue two of the four closing arguments, one for each side. The remaining summary will be published in the June issue.

Closing Argument on Behalf of Government By Mr. Harris

MR. HARRIS—If your Honor please, counsel for the defense, ladies and gentlemen of the jury:

We are now coming very close to the time when you will decide whether or not the Government has proved beyond a reasonable doubt that the defendants did the things that have been charged against them.

So that your memory may be refreshed as to what the evidence will apply to, I just call your attention to the charge again very briefly, that we have charged them with maintaining and enforcing an arbitrary, artificial and unreasonable policy and program of distribution and restricting the channels of distribution through which hog-cholera serum and virus—which is the only thing now involved—are sold and distributed in interstate commerce for distribution to consumers, which we say was in restraint of trade.

Then the things that we say they did were that they agreed to combine together to sell hog-cholera virus and serum only to veterinarians who were graduates of approved veterinary colleges and those people who sell only to them; that they refrain from selling these products to others who would sell them to persons who were not graduate veterinarians; that each producer would refrain from direct advertising to the farmer of the hog-cholera serum and virus; and that the Associated Serum Producers, their organization, would require them to do these things.

Now, in coming to a decision in this case, there will be just two simple questions for the jury to answer.

1) Did the defendants agree and combine together to do the things that I have just read to you?

2) Was that an unreasonable restraint of trade, if you find there was such an agreement?

I will take the two subjects in that order.

Now, first, was there an agreement? Did they combine? Did they come together to do the things we said,—to sell their products, all agreeing together, that everyone in the combination we charge would sell their products only to veterinarians and to those who would sell only to veterinarians, and I believe it will be held that if you find that they

did do that thing, if you find that that was unreasonable, that it unreasonably restrained trade, then I think you will find the defendants guilty in this case.

Now, you will have noticed, of course, that each of the defendants was put upon the stand and each defendant was asked by his counsel, "Did you agree with the others to do these things?" and each defendant answered, "No."

The jury have a right to take that into consideration. These people, you have seen them, good looking people, successful men of a business that is a good business, a business engaged in caring for animals which are part of the food of the people, and the question might very well come into your mind, "Why are they here? Why are they defending themselves at this time? Why is the Government prosecuting them?" And I say that all those things are properly taken into consideration by the jury. But I say when that question was asked of those witnesses and they truthfully answered "No," as they saw it, what the counsel was referring to was this sort of an agreement, where I say to you, "Let's do these things together," and they say, "We never said that to anybody. We didn't come and say to each other, 'Let's do these things together.'"

What then does the Government say? They did agree and they did combine. This way:

A man in law and in life is considered to have intended the things he does. We are considered, as sane people when we do a thing, to have intended to do it. We are not speaking of accidents or falling downstairs in the dark, or things like that, but conscious acts of our will that we intend to do, and we say that the Government has proved beyond a reasonable doubt in this case—and I might say just at this point there is very little conflict in the evidence here—the jury are greatly helped in their decision in this case by the fact that it will be practically one set of facts which will be discussed by both ourselves and by our brothers on the other side, and it will be from the same set of facts practically that the jury are going to draw an inference of guilt or innocence.

Now, what are the facts? We say that it is—and there is no question about it—that these various defendants, and when I speak of defendants I am speaking also of the corporations that you don't see here, the corporations who are represented, the corporations whose men are here—in some cases there are certain members of the corporations indicted as well as the corporations, and so when we talk of defendants, you don't think just of those people sitting in the court room, but you think also of those companies they represent, and that is an important thing to think about in this case, because it has a very important bearing on the effects of their actions.

Now, we say that they had—each company had long before 1933, the date of the formation of the Serum Producers—a policy. That is agreed in this case, and to that policy each company, as I told you in my opening statement, may have come of its own volition, absolutely without reference to anybody else; we don't know, and it is quite likely, and as they told you one after the other how they came to make that policy for that company, the ideas they had about it, the feeling that they thought their products would be better handled, all of which may be perfectly true and quite proper: "That," they say, "is how we arrived at our decision."

As to that, as I told you, the Government has no concern. Those people are working in a free competition, free open field. Every man as long as he keeps within the law is entitled to decide how he will run his business. He is entitled, unless it is one of these public interest cases, like a public utility, to say to whom he shall sell. He is entitled

to say who he shall buy from, and it doesn't have to be a question of credit, this, that, or the other thing.

But we say when he combines with others, when he makes a force, when he makes a power in the economic world that may affect those who are not in that combine, then the Government thinks it is time to let a jury see what is what.

Now, did they combine? We say that they came together in 1933. They came first of all together in this Association, the American Association, and then came together in Associated Serum Producers, Inc.

Now, we say that, although I might not have said it, one might not have said to another, "Let's go and join the Associated Serum Producers," when they joined, they evidenced an agreement that they would work together.

The fact, then, that a number of them signed these articles, and then they became members of this corporation, evidences to anyone a matter of agreement. If you do not agree with what Associated Serum Producers is going to do, stay out of it; if you do agree, join it. We don't have to show that Mr. Norden spoke to Mr. Williams and said, "Let's join the Associated Serum Producers." It does not make any difference to us who said that to him. What we say is we have shown this jury that they did get together and that they did join this organization.

Now, the question will be asked, "Well, it is all right, isn't it? They all have the same kind of ideas. Why can't they join an association?"

Well, why not? We have to go further. We have to ask, "What did they do in the Association?" What, when they had gotten together, did they do about the situation of competition? What did they do about restraining trade in hog-cholera serum and virus to veterinarians only?

They said, "We only did, when we got together, what we did separately. What is the difference? It is the same organization."

I say that the difference is apparent to you all, that when they got together the things they did were far more powerful, far more effective, did a great deal more to the hog-cholera virus and serum business than they did when they remained separate. And what did they do? Did they just get together and, as they say, advertise that it is better for a veterinarian to vaccinate a hog?

Now, they have a right to say that, a perfect right to say that. But you have to remember that when they say that, there are in existence other companies, other houses that are trying to get the hog-cholera virus and serum business. These houses have chosen their policy, that they will sell to anybody who asks for it.

The Government has to show beyond a reasonable doubt that what these defendants did in this combination, which I claim you will be able to find existed, was something that affected the whole trade; was something that unreasonably restrained the trade, that unreasonably made it more difficult for others to operate in an open field of competition, because in this case, ladies and gentlemen, the Government's position is that the field should be open and that there should be no unreasonable restraint for anybody, not just for Mr. Swaim or for Mr. Somebody Else who has had a business for years, but for the man who tomorrow wants to go into the hog-cholera virus and serum business.

All right. What did they do? What kind of things were done? What sort of advertising was put out? What was the intent, as shown by their actions, and not by what was in their mind? Let's see.

Now, I am reading to you,—and I am not going to take up much of your time, I haven't much to give anyway—from the minutes of the Associated Serum Producers. This is May 5, 1934, and it is now moved by Dr. Cahill and seconded by Dr. Maxwell that the following be adopted as a state-

ment of policy of the Association, and that the advertising committee be guided by the same:

"Associated Serum Producers, Inc., is an organization of leading producers whose object is to protect the serum industry and safeguard hog raising through the proper administration of serum and virus."

And it has been testified by more than one gentleman that the proper administration of serum and virus means the administration by veterinarians only. That has been asked and answered in this case.

Now, you have them here, having joined in 1933, they all got together in 1933, and now in 1934 they are making a statement of their policy. Does that evidence an agreement? I mean, we are looking at this thing in a common sense fashion. They don't deny that that is the minute, that that happened, that that is the statement. And can you say that all those people who stayed in the organization after that minute was put on record agreed with the policy? Do they have to talk to each other and say, "That is a good policy; let's agree to it?" Would we ever find out if they ever did? Of course we wouldn't. We have to go on the evidence that appears here that we have.

Now, I just call your attention to one or two more. They are now going into an advertising campaign, and I say to you, ladies and gentlemen, that the heart of this case is the advertising campaign. It is the thing they did when they got together, the power they exercised in the combination, and now in this minute, this minute of 1934, April 4, and May 5, the question of the advertising for the following year comes up. Should they have an advertising campaign?

Fourteen companies, and they read here, and among them are quite a number of the defendants, fourteen companies voted "Yes" and one company voted "No."

Is that an agreement; is that an agreement to go on with an advertising campaign? Isn't that of record? Fourteen of them say, "Let's say yes, let's go on with the advertising campaign." One says, "No,"—Missouri Valley—and they hope, they say, that Missouri Valley will go along with them.

I won't take up your time further. You will have this. And in meeting after meeting, when the question, "Shall we spend so much money; shall we assess ourselves so much for this campaign?" comes up, the answer is moved, seconded, and carried.

Is that an agreement? How else can we show an agreement but by the things they do?

Now, let's come to this campaign, the advertising campaign which we say was one of the instruments of their combined policy; which we say was one of the ways in which they unreasonably restrained trade.

I say, I submit to you, that this is more than just an ordinary advertising campaign, when taken into consideration with the policy shown in the letters to the veterinarians. They say to you, and they have said to you, and witnesses one after another have said to you, and we haven't cross-examined on it—why should we—we believe that these people feel, they feel undoubtedly that it is better for a veterinarian to vaccinate a hog than for somebody else, and they are entitled to their opinion—we feel that they feel that their products could be better handled by a veterinarian. They are entitled to that individual opinion. We say they are not entitled in an industry such as this, a competitive industry, to get together and see if they cannot make the situation such that nobody but a veterinarian can buy hog-cholera virus and serum, and I say that was the purpose of this campaign. That is why we are here.

See whether we are right or not.

I am going to call your attention, first, to ASP Exhibit 8, and this was the year 1937, and it is a report of the advertising committee, and I am

only reading to you the first sentence: "Your committee is pleased to report that the advertising program submitted to the members last month was met with unanimous approval by all companies."

Now, what was that advertising program in these various years?

Well, they had two ways, two appeals. They had an appeal to the veterinarian, and that appeal was different from the other kind. The veterinarian would get this sort of thing (indicating exhibit); there were, they testified, several thousand veterinarians that would get this kind of letter. To the veterinarian they would say, "Read our type advertisements in all leading farm publications of the hog producing regions featuring the danger of hog cholera and the importance of having the veterinarian immunize the pig crop as the only safeguard against this disease," and you might remember that when I suggested to one of the witnesses that the advertising was confined to urging people to vaccinate only by veterinarians, I was rather called to task. Well, read it for yourselves.

With this letter they showed to the veterinarian the other type of advertising. So that when you consider whether they are just advertising to the world and to the farmer, "You should have a veterinarian vaccinate your hogs," which probably they had a perfect right to do individually, and perhaps together, if there were not some other things which affected the economic situation unreasonably, you will remember that with every broadcast to the farmer, "It is dangerous" or that "It is improvident" or that "You will have terrific costs, if you vaccinate these hogs yourself." They told the veterinarians, "See what we are telling the farmer. We are doing that for you. We are putting up our money, we have pooled our money, we are doing it for the veterinary profession." "Now, you know your duty. Your duty is to buy only from us. There are other houses in the business. You know that. But we are the ones you should patronize." And very successful have they been.

They tell the veterinarian the whole purpose is to arouse farmers to realize the dangers of cholera and other major diseases. Perfectly proper. "And to bring those farmers to you, to the veterinarian, for advice and proper methods."

It is not quite so proper when it is in combination and when you have competitors who have a different policy from your own.

I am not going to read these to you; they will be there; you will see them, and you will undoubtedly consider them. But there is something I do want to call your attention to in one of these, because I am now going to discuss for a minute the question of the American Foundation of Animal Health. That was one of their organizations. It is perfectly all right for them to have it, but I say to you, that when the farmer read that the American Foundation of Animal Health was one of the major organizations in the fight against this disease, he would not know that that was the Associated Serum Producers advertising on behalf of them and the veterinarian.

Now, all through here, and you will take them—I am not going to stop to read them—you will find statements of policy one after the other. These were made at the time the things were being done. The places are marked. You can look at them. And you will see whether at the time they were doing these things they did not state, as they did, just why they were doing them. They were doing them to get all this business in the hands of the veterinarians only. They were not only bringing the veterinarians to themselves; they were bringing the farmer to the veterinarian. They were taking the farmer away from the lay house, and, in one or two of these cases, you will see they definitely say that a lay house should not be supported. You will find them right in there. (Indicating documents.)

Now, was that reasonable or unreasonable? That is the other question, and that is the only one that I am going to discuss with you.

They say it was a reasonable policy because vaccination of the hogs should be done only by veterinarians. Now, is that the reason? It is certainly reasonable to have that opinion. I could have it and you could have it, and certainly a veterinarian would be expected to have it. That part we are not concerned with at all, but we are concerned with whether men holding that opinion can reasonably get together and restrain the trade in hog-cholera virus and serum, because their purpose is to take away from everybody but the veterinary house the trade in this business. That is another thing.

Now, they say they do that to protect the farmer. I say that they do that to increase their own business, and if it were lawful who would say them nay? If they were individually fighting it out with the rest of them, they could advertise to their hearts' content that kind of thing because then it is a fair field and no favor. A layman is advertising to the farmer, "It is all right to vaccinate your hogs." A veterinary house is saying, "It isn't all right."

Well, a farmer can choose for himself. But when you get an organization like this using all these methods, fighting this game this way, I say you have a different situation.

Now, is it reasonable to say that a farmer can vaccinate his hogs? Quite reasonable. Quite reasonable. Millions of cc's are sold to the farmer through the farmer houses, and their own witness, a very high class man, Dr. Hagan,—I asked Dr. Hagan, and very frank he was, just like a true scientist. I showed him this.

"Is it easy for somebody to do this thing?"

"Not difficult."

"What is required?"

"Care, cleanliness."

"Would you rather have a careful farmer vaccinate hogs or a careless veterinarian,"—and there are both kinds; there are careless veterinarians and there are careful veterinarians; there are careful farmers and there are careless farmers, and he said, "I would rather have a careful farmer than a careless veterinarian." And why shouldn't he?

One other thing. They tell you the farmer shouldn't be trusted with this bottle, that one twenty-five thousandths of a drop, and a million hogs are gone.

Well, the United States Government permits this to go out. It simply tells you on the container, "Be careful with it," and do you think for a minute that the farmer who owns the hogs, whose whole fortune is bound up in his animals is going to be so careless that he can't be trusted, but must pay the fee of the veterinarian?

I submit to you that in this case the government has proved its case beyond a reasonable doubt.

Closing Argument on Behalf of Defendants By Mr. Borders

MR. BORDERS—May it please the Court, ladies and gentlemen:

We have been here two weeks in the trial of this case. We are at the conclusion. We have had a few chuckles here and there as we have gone along. But my statement to you will consist of no oration or no facetiousness, but merely a discussion of the facts as they have been brought out in the evidence.

I could say to you that, if this case were not one involving the reputations of these men, it might be rather funny and rather humorous because of the complete lack of evidence produced by the gov-

ernment to prove what they have charged, not only to prove some agreement, but a lack of evidence to prove any agreement which they have charged. The reason that I do not indulge in comments of that character, however, is simply the fact that these men have been brought here by these prosecutors, charged with the commission of a crime. These men have their own reputations at stake in this case, and it is important to them. They have their own characters and their life-work bound up in this case, and, therefore, it does become important and it becomes necessary to discuss this matter from that angle.

Now, I accept the challenge of Mr. Harris that there are but two questions in this case. One, was there a conspiracy or combination or agreement, and, two, was it reasonable?

I want to differentiate, however, as to the first proposition. Was there a combination? Mr. Harris says, "Why, yes, there was a combination because they entered into an association." He says also, "Yes, there was a combination because you agreed on a certain advertising program."

That, ladies and gentlemen, is true. We did agree to those things, but that is not the agreement with which we are charged in this case. They charge us in this case with agreeing to limit our sales to veterinarians only. Now, I say to you that there is not one scintilla of evidence to prove any such agreement.

Why, certainly we entered into an association, but if everybody who enters into an association is guilty of violating the Sherman Act, God help you. Ninety-five per cent of the men in business in this country would be in violation of the Sherman Act; and if every agreement that has anything to do with advertising and that in any way affects interstate commerce or trade is in violation of the Sherman Act, then probably seventy-five or eighty per cent of the business men in the country are guilty under that Act.

That is not what we are discussing here. Yes, we did make certain agreements. We did make certain commitments, but we did not make the agreement that we are charged with here.

Now, what is that agreement? They say that we agreed to limit our sales to veterinarians only. Now, did we or didn't we?

You understand, ladies and gentlemen, not only must the government prove the guilt of the defendants beyond any reasonable doubt: If there is any question at all, then they must be found not guilty, but I am not going to argue with you on that basis. I am going to argue with you on the basis that there was positively no such agreement.

Mr. Harris says, and says rightly, that anybody has the individual right to choose and select his own policy of selling. That is the law, there is no question about it, but he forgot to tell you one other thing, and that is this: There is a presumption of law that, when a man has adopted an individual policy, he continues that individual policy until he himself changes it. In other words, once an individual policy is adopted, then that individual policy continues as an individual policy until that man himself does something about it.

In this case, the evidence shows that every single one of these defendants adopted this same identical policy that we are talking about many, many years prior to 1933, when this association was formed. Every single one of them, without exception, did that, some as far back as 1911.

Now, does the mere fact, the mere suspicion—that is what this case is, suspicion—does the mere suspicion on the part of the prosecution in this case convert this individual policy into a horrible conspiracy merely because and simply because they joined this association?

I say to you, "No."

There are two kinds of evidence in a case of this kind. One is direct evidence and the other circumstantial evidence. There is not one word of direct evidence of any conspiracy or agreement

such as has been charged here in this case. There is nothing but circumstantial evidence and suspicion, and you well know the dangers of circumstantial evidence in any criminal case of any kind whatsoever.

Now, we may say to you, ladies and gentlemen, in arguing inferences—and that is all the government is talking about, they are seeking to draw inferences here—let's talk about inferences for a minute.

What conceivable reason was there for these men to agree in 1933 on a policy which they had all had for many, many years prior to 1933? What was the necessity for it? What was the purpose of it or the object of it? Why, the mere statement of it is so perfectly plain that it is silly, and I say silly deliberately and consciously. I say it is silly to infer, as the prosecution has, that, because the defendants got together in the Association, they agreed to the policy that they had had for twenty years or more. They didn't have to agree. They accomplished nothing by any agreement. The only thing was that they did have a similar policy, and why shouldn't they get together into an association which had proper and legal objectives?

There had always been this general division in the trade between those who sold to the laity and those who sold to veterinarians. Everybody in the trade knew that. It was approved by the government in the NRA; it was approved by the Secretary of Agriculture in the Marketing Agreement and Order later on. It had been in effect for many, many years. Everybody knew that. There was no necessity and no point in their coming together and agreeing on some kind of a restricted sales policy when they already had it and when they were already in their particular slot where they belonged. There was no point in their getting out of that slot.

Furthermore, I would like to say this, that in my opinion the very reasons which they adopted for their policy negated any agreement. They did not all have the same reasons for the adoption of their policy. You remember Dr. Cahill's reason, primarily, was that he did not want to sell to the laity because he was afraid it would jeopardize the reputation of his products and his good name and good will. All right, Mr. Rathman, on the other hand, had an entirely different reason, not the same at all, and it involved purely economic business reasons. They all had different reasons and different purposes in adopting it. That mere fact alone negatives any combination or common understanding in the formation of any agreement as to a restricted policy.

Now, for a minute, let's talk about this Association which Mr. Harris thinks is so terrible, and about this advertising program.

Why did we join an association? Well, we did because of the fact that the agricultural condition in the United States was poor. The price of livestock was down. Farmers weren't vaccinating. Our own business was poor, and we felt that something was necessary. In order to suppress competition? To suppress trade? To restrain trade? Why, silly! Of course not! What we got together for at that time was to improve trade and to increase trade, and that is what was actually done, and I will show you in a few minutes by the figures.

Why, the government says here that we got together to restrain trade. Why, heaven bless you, what we were trying to do was to get out of the pit and the morass that we were in in 1933, and that was the only objective of this. So we did what? We formed an association, this horrible, horrible conspiracy.

Now, that association was formed for certain purposes. One was to operate a retail credit bureau, on a properly legitimate, properly lawful, business-like basis, and we did that. Was there anything unlawful or wrong about that? Isn't that

the usual purpose and objective and activity of a trade association?

We also set up committees to work with the Bureau of Animal Industry, with ODT, with WPB, the Wage and Hour Administration, and so forth. Those things vitally affect our business, and we could accomplish things better through joint action than we could through individual action. There again it is the perfectly normal operation and activity of such an association. Is there anything wrong with that?

Now, again, we engaged in activities in connection with retail sales taxes. Is there anything wrong with that?

We also worked with the NRA and developed a code in line with the government's requirements and desires. Is there anything wrong about that?

The same was true of the Marketing Agreement and Order. But Mr. Harris says, "You carried on an advertising campaign, and that is the heart of the case," and that is what makes this terrible conspiracy.

Now, what was the advertising campaign? The purpose of that campaign was to increase trade, to develop the use of anti-hog-cholera serum and virus in the hope that the member companies would get their fair share of that increase in trade, and, ladies and gentlemen, trade did increase. Now, whether it was due to the advertising campaign and program or not, I don't know. It did increase and we got a part of it. We did not get all of it by any means, but the purpose of that campaign was to increase trade and develop sales in our products.

If that is wrong, then every advertiser in the United States is wrong and should be clapped into jail immediately.

But Mr. Harris says, "But that isn't so bad maybe, but you boosted the veterinarians." Why shouldn't we boost the veterinarians? They were our customers, and if you want to increase the sale of flowers, we will say, do the people who grow the flowers not do exactly the same thing and boost the neighborhood florist? Isn't that the usual, normal and proper way to carry out an industrial campaign of advertising? Is there any other intelligent way that you can do it?

And so, pray, I would like to know what was wrong with our boosting the services of veterinarians?

But Mr. Harris says, in his suspicious mind, "You asked the veterinarians to patronize you." Now, just what is wrong with that? Why shouldn't we ask them to patronize us? We are developing business for ourselves, it is true. Sure, we had a selfish motive and purpose in it. We are not pretending to be angels in any sense of the word. Maybe we did have a selfish motive, but we were always promoting practice for the veterinarian, and we had every legitimate right under heaven to ask him to patronize our companies. I say that, far from there being anything wrong about that, or to be criticized for, it is the only intelligent way to advertise in an industrial campaign. You can't do it any other way and get any proper results, and we did exactly the right thing, the thing that everybody in business does, and we are not to be criticized for it.

Now, in that connection, here is a blow-up of something that the Allied Laboratories put out in 1914, nineteen years before this horrible conspiracy was made, and in this advertisement—by the Pitman-Moore Company—they say, "Then you will get in touch with your licensed graduate veterinarian, one who is prepared to administer the serum intelligently and skillfully. You will instruct him to immunize your entire herd with Pitman-Moore anti-hog-cholera serum." In other words, the company was doing that in 1914, and I presume has done it ever since, the very thing that was done after 1933, which was to boost the veterinarian. That is the evidence, if you please, directly nega-

tive and contradicting the suspicious inference that Mr. Harris draws from that advertising, because it shows that these people were doing this individually long before 1933, and when you have direct, positive evidence to negative an inference, the inference cannot be indulged in, and very properly it should not be.

Now, the use of the name, American Foundation of Animal Health, which Mr. Harris has kind of gotten away from,—he says, "Well, I guess that is all right now," and of course it is all right. It is the usual and proper thing. In conclusion, on this advertising program, I want to say this: The charge in this indictment is that we agreed we would not advertise direct to the farmer. That is the language of the indictment. Every piece of literature that went out, excepting those that went to the veterinarians, telling them what we were doing for them, which was proper, was directed to the farmer. We were trying to induce the farmers to become conscious of the fact that it was to their own selfish interest to immunize their hogs against hog cholera. That was the purpose of it and we certainly did not make any agreement such as is charged by the indictment.

Therefore, I say to you, ladies and gentlemen, there was no agreement made such as is charged in the indictment. We made agreements, yes, but we did not make any unlawful agreement and we did not make the agreement that was charged in the indictment.

Now, the next question is, even assuming that there might have been some agreement, was it proper for us to adopt this policy? Mr. Harris says no, it was not proper because of the fact that a layman, a farmer, can take this syringe, fill it full of serum or virus, and stick it into the hog, the pig. Well, we do not claim that that cannot be done. We know that it is being done. Any one of these defendants, if asked, would tell you, "Why, of course it is being done, and it can be done." That isn't our position in this case.

As stated a number of times in the course of the trial, our position is that it is better to do it by means of a veterinarian.

Now, we very frankly want to have our product in the hands of the people who we think are the best qualified to handle our product for the reputation and good name of our product and of our business. That is a selfish motive, yes, but nevertheless it is true and we think it is the right motive from the standpoint of the livestock owner himself. It isn't just a mere question of manual dexterity with a syringe.

Here is another advertisement, put out by one of the defendants in 1930, which says, "What is behind the serum syringe?" Now, in that they say, "The use of pure, virulent virus and pure, potent serum is only part of the insurance which every swine herd needs. Equally important is the assurance that these are used correctly. And that calls for a scientific understanding of hog cholera in all its phases, including the many diseases which resemble and frequently complicate it."

Right there is one of the major reasons we adopted this policy; there are complexities of swine diseases, which the deans here and the defendants themselves outlined to you, where we say, and we say properly, that the trained man is better qualified to differentiate between one disease and another.

Now, get this: There's isn't one word of evidence on the part of the government to contradict that, and, therefore, that evidence must be taken as one hundred percent true in your consideration of this case, and if that is true, and there is no doubt about it—these deans of veterinary medicine wouldn't come here and tell you something that was not—if that is true, then there was every sound reason for the adoption of the policy which we adopted, and if that is true that means an end to this case right there.

"It calls for a scientific knowledge of bacteria, antigens and biological reactions—a knowledge possessed only by the college trained veterinarian whose diploma guarantees that he has acquired that knowledge to the satisfaction of his instructors. To gain this knowledge, your veterinarian has put in many hours of experimental and clinical work in college, spending thousands of dollars and years of time with text books, microscopes and dissecting instruments. These are some reasons why Allied Laboratories, Inc., confines the use of its products to graduate veterinarians."

Those are the reasons.

Here in Exhibit AL-18 is the statement by Dr. John R. Mohler, probably the foremost man in disease control and the eradication of disease in the history of the United States, formerly chief of the Bureau of Animal Industry and now retired after a very remarkable career. Here is what he says; this is just a part of it:

"It behooves the livestock producer not only to see that his community is served by a qualified veterinarian, but that he receives the support of all as an essential part of the community. He can supply valuable service regarding sanitation, immunization, and other indicated measures. To avoid losses from disease these measures must be applied at the proper time—at the proper time. That is important from our standpoint, from the standpoint of our product, that they be in the hands of a trained man—and the qualified practitioner is in a position to render this service better than others"—precisely our position—"because of his training in all branches of medicine, including pathology, bacteriology, immunology, and his familiarity with the symptoms and manifestations of livestock diseases." That is our case on this proposition of reasonableness, and if we cannot rely on that kind of an authority, Dr. John Mohler, I don't know what we could possibly rely upon. Certainly I will say this, that I will take Dr. Mohler and Dr. Dykstra, who told you from the stand, when Mr. Harris thought he had a big point with Dr. Hagan—who thought he was talking merely about some manual dexterity—Dr. Dykstra told Mr. Harris, "Well, that is only a little, small part of this problem. It doesn't mean much." I say I will take the word of Dr. Mohler and Dr. Dykstra before I will take the word of Mr. Harris on the question of the reasonableness of our policy.

We were simply trying to do the thing that we thought was right from the standpoint of our products and from the standpoint of the protection of the livestock population of this country. We utilized the best, the most scientific information that we could get, all of which, without exception, is to the effect that the better—as Dr. Mohler said—the better way is to entrust these products, dangerous, if you please, poisonous, if you please, to the hands of trained people.

Now, if that is not a good reason, I don't know one, and that was the reason for the adoption of this policy, and the government cannot deny it, and when that is understood that is an end to this case.

Now, ladies and gentlemen, at this point I cannot help but be a little amused, although, as I say, this is serious to these men as individuals. It is serious to anybody to be charged with a crime—of course it is not a crime like robbery or murder, nevertheless it is something that goes home—but I was amused at Mr. Harris' statement to you about the effect of this horrendous "conspiracy."

You remember he stated in his opening statement that we went into this combination for the purpose of putting the lay companies out of business. You remember that. That was the closing shot at you in the opening statement. We did all these terrible things to put the lay companies out of business, and today he says that the effect of this thing was horrible.

Now, let's see. Again, are we talking about suspicion? Are we talking wishful thinking on the part of the prosecution, or are we talking facts? Let's see.

In the first place, Mr. Russell of the Illinois Agricultural Association and the Illinois Farm Bureau Serum Association, the largest purchaser of serum in the world, took the stand and told you that he could get all the serum that he wanted; that they did get all that they wanted without any difficulty, and he could have gotten more if they so desired.

Did this awful conspiracy have a bad effect upon the Illinois Farm Bureau Serum Association representing, I suppose, 100 or 150 thousand farmers? Did it affect them in any way, shape or form?

The Indiana Farm Bureau man, Mr. Murray Barker, gets on the stand and he tells us, in effect, "Why, these people are doing exactly the right thing."

By the way, that reminds me of something that I overlooked as to whether there was a conspiracy. Murray Barker got on the stand, along with Dr. Harwood and Dr. Kushner, and told you ladies and gentlemen that they were in this association (Associated Serum Producers) and that there was no agreement such as charged by the government in this case.

Now, Mr. Harris can say all he wants, with his type of mind, but, of course, we would deny that there was any agreement. But there are three men now outside the Associated Serum Producers organization who have no interest in this case, who were formerly in it and who came in here and told you that there wasn't any such agreement.

Now, getting back to that question of effect. Mr. Young got on the stand and told you that any farmer, any livestock owner, at any time could get all of the serum and virus that he wanted. There had never been anybody who suffered because he could not get serum and virus. So was this restraining trade? Was anyone deprived of what they wanted?

Dr. Cahill got on the stand and told you that when he got orders from livestock owners which he could not fill, because of his company's policy, that he turned them over to the lay companies.

Dr. Jones was in the audience here, and he heard Dr. Cahill testify that he had referred these orders to him; Dr. Jones was subpoenaed by the government, and if that wasn't the fact he would have got on the stand and told you so.

Now, that illustrates another point. Were we trying to put the lay companies out of business, as Mr. Harris says, when we were sending them business? Was Allied Laboratories trying to put the lay companies out of business when they changed their policy in South Dakota, tightened up their policy and got rid of a lot of business that had to go to somebody else, and presumably to lay companies? And was Corn States Serum Company, when they made their change in policy, doing the same thing? Were these men motivated in any way, shape or form, with an objective of putting the lay companies out of business when they did that kind of thing? No. They were trying to build their own business, true, trying to do it from a monetary selfish standpoint, true, there is no argument about it, but at the same time they were protecting their own individual policy, and if that meant losing business, all right. But nobody—and this is the point—nobody suffered.

Now, the government introduced this table. It shows the gross of business of the various companies from 1935 on. Now let's see.

I think the American Serum Company, which is a lay company and has been referred to here—I am sorry we don't have these figures back to 1931, but we don't—but they grew from six million dollars in sales in 1935 to fifty-four million in 1941. Were they restrained? Were they affected? A growth of almost nine times in seven years.

I will pick out another one. Here is the Fidelity Laboratories that Mr. Swalm represents, and he testified here they grew from six million to forty-six million, a growth of over seven times, in seven years. Were these lay companies being put out of business?

Now, more important, the government may say, "Well, that is just two of them," and I don't have time to run all the way through them. We have prepared and we put in evidence, as the last bit of evidence in this case, this exhibit showing the per cent of increase by classes of companies between 1935 and 1941. The classifications that are made here are the government's classifications. They made them. We didn't. We took their classifications and had Price Waterhouse, C.P.A.'s, draw up figures, and these are the results. Now, get this. This terrible advertising campaign and conspiracy that was going to put everybody out of business, going to wreck it. The defendant producers—everybody's sales went up, I might say, in that period, and it may be that part of this increase was due to our advertising program. I hope so. I hope that that was the case. Everybody's sales went up, but the defendant producers went up 290 per cent; that is, their business was almost three times in 1941 what it was in 1935. Those are our companies now. We increased almost three times, which was pretty good. But wait. The nondefendant producers, who sold to veterinarians only, went up 568 per cent, five times, over five times. So those who had this policy that we had, and who were not in this terrible association, did a whole lot better than we did. We did the worst of anybody.

The producers advertising veterinary sales only but who sell to wholesalers, and dealers who sell to consumers, their sales increased 386 per cent; the producers with a dual purpose policy—you heard that explained—427 per cent; and the producers selling principally to the laity, 323 per cent.

Now, in other words, our companies, these defendants, suffered, comparatively speaking, with all of the other companies in the United States. We did not do as well as any other group of companies, bar none. There is the result. There is the net result. First, you have a situation where every farmer could get every drop of serum he wanted, and, secondly, the largest purchasers got all they needed, and, thirdly, we were turning orders over to the lay companies when the orders did not fit in with our policy, and, fourthly, our progress was not nearly so marked or so good as the progress of every other group in this business.

If that is an example of the type of antitrust case that is being brought, I say to you it is a shame to spend the time and the money at this time to prosecute a case of this sort, the time and money of you people, of us, the defendants engaged in a vital portion of the war effort, and of the taxpayers, to bring a suit based on the proposition that there was an agreement to do—what? To restrain trade, and when you see at the close of the case—and this the government cannot and will not deny—when you see at the close of the case that the results of the defendants' efforts were to increase trade and promote trade, and that there was very definitely and positively no restriction or restraint upon interstate trade whatsoever, and when you come to that result the whole case fades into absolute nothingness.

(To be continued)

Additional Proposed Amendment of By-Laws

Amend the first two sentences of the second paragraph of Section 2, Article VI of the Administrative By-Laws so they will read as follows:

The treasurer shall pay all of the legitimate expenses of the Association, including drafts

to reimburse the revolving fund issued by the executive secretary or, in his absence, by the assistant executive secretary, and signed by the president. He shall issue checks against the treasury only on the signed approval of the president and executive secretary or, in the latter's absence, by the assistant executive secretary, who shall furnish serially numbered vouchers containing full details of the nature of the expenditures.

APPLICATIONS

The listing of applicants conforms to the requirements of the administrative by-laws—Article X, Section 2.

First Listing

AUSTIN, FRANCIS M.

West St., Belchertown, Mass.

D.V.M., Grand Rapids Veterinary College, 1915.

Vouchers: D. S. Shannon and J. H. O'Brien.

BARTHELME, L. F.

1418 Madison, Topeka, Kansas.

B.V.Sc., Ontario Veterinary College, 1927.

Vouchers: R. F. Coffey and A. H. Quin.

BOYD, W. J.

Harrow, Ont., Can.

B.V.Sc., Ontario Veterinary College, 1933.

Vouchers: C. D. McGilvray and L. Stevenson.

CHINCHON, RENATO

Veterinario Sanitario, Cauquenes, Chile, S. A.

M.V., Escuela de Medicina Veterinaria, Universidad de Chile, 1944.

Vouchers: J. San Miguel and O. Bastias.

CUEVA, GERARDO

Dassel, Minn.

B.V.Sc., Ontario Veterinary College, 1939.

Vouchers: W. L. Boyd and H. C. H. Kernkamp.

FINCHEIRA, OSCAR

Casilla 805, Temuco, Chile, S. A.

M.V., Escuela de Medicina Veterinaria, Universidad de Chile, 1944.

Vouchers: J. San Miguel and O. Bastias.

JACOBSON, H. W.

Havre, Mont.

D.V.M., Washington State College, 1935.

Vouchers: B. O. Fisher and V. H. Fisher.

NORAMBUENA, MIGUEL

Casilla 48, Santiago, Chile, S. A.

M.V., Escuela de Medicina Veterinaria, Universidad de Chile, 1943.

Vouchers: J. San Miguel and O. Bastias.

PAPINEAU, WILLIAM W.

2811 W. Olive Ave., Burbank, Calif.

D.V.M., Washington State College, 1934.

Vouchers: P. C. Lockhart and R. J. McWherter.

RAFOTH, LESLIE J.

Veterinary Detch., Fort Snelling, Minn.

D.V.M., Iowa State College, 1943.

Vouchers: V. B. Vanderloo and H. D. Bergman.

SOTOMAYOR N., GONZALO

Guayaquil, Ecuador, S. A.

M.V., Escuela de Medicina Veterinaria,
Universidad de Chile, 1941.

Vouchers: J. San Miguel and O. Bastias.

TELLEJOHN, A. L.

2518 Westwood, Nashville 5, Tenn.

D.V.M., Kansas State College, 1936.

Vouchers: L. E. Seay and T. E. Willis.

Second Listing**Burt, Clark E.**, Office of the Veterinarian, APO
678—c/o P.M., New York, N. Y.**Carmelo F.**, Cedro V., Ayda, Del Tejar 4062,
Buenos Aires, Argentina.**Hair, V. H.**, Bunkie, La.**Hoffmire, Colenzo H.**, 1220 St. Charles, New
Orleans 13, La.**Jameson, Lloyd E.**, 188 Outer Drive, Oak Ridge,
Tenn.**Keim, J. Kenneth**, 207 N. Narberth Ave., Nar-
berth, Pa.**King, John P.**, 4730 Lenore Dr., San Diego 5,
Calif.**Radloff, Donald B.**, Conrad, Iowa.**Shull, Albert J.**, 19640 Carrie St., Detroit, Mich.**Siegel, Morris**, Veterinary Station Hosp., Fort
Bragg, N. Car.**Sprott, Darrell B.**, Rt. No. Box 182, Killeen,
Texas.**Wills, M. H.**, Ridgefarm, Ill.**1945 Graduate Applicants****First Listing**

The following are graduates who have recently received their veterinary degrees and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of junior chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

Alabama Polytechnic Institute**SHULER, JAMES M.**, D.V.M.

823 York St., Aiken, S. Car.

Vouchers: E. S. Winters and O. E. Jung, Jr.

Cornell University***BARTZ, NORMAN W.**, D.V.M.Rt. 8, Box 100, Rocky Mount Rd., Roanoke,
Va.

Vouchers: H. C. Stephenson and H. J. Milks.

BERRIGAN, MARTIN V., D.V.M.

198 Storer Ave., New Rochelle, N. Y.

Vouchers: H. C. Stephenson and H. J. Milks.

BEYER, THEODORE J., D.V.M.

27 Adrian Ave., New York, N. Y.

Vouchers: H. C. Stephenson and F. E.
Beaver.**COLVIN, A. STANTON**, D.V.M.

Wolcott, N. Y.

Vouchers: H. C. Stephenson and A. G. Danks.

DREW, DONALD R., D.V.M.

Warwick, N. Y.

Vouchers: J. N. Frost and H. C. Stephenson.

DUNCAN, CHARLES S., D.V.M.

512 Dryden Rd., Ithaca, N. Y.

Vouchers: C. E. Duncan and A. Zeissig.

EVANS, ALVIN, D.V.M.

61 E. 182 St., New York, N. Y.

Vouchers: A. G. Danks and H. J. Milks.

GREER, RUSSELL F., D.V.M.

Boston Neck Rd., Suffield, Conn.

Vouchers: H. J. Milks and H. C. Stephenson.

GUZMAN, LISBETH K., D.V.M.

106 Quarry St., Ithaca, N. Y.

Vouchers: H. C. Stephenson and J. N. Frost.

HAIFLEIGH, WILLIAM J., D.V.M.

Valley Falls, N. Y.

Vouchers: H. C. Stephenson and H. J. Milks.

HARMON, HOWARD, D.V.M.

127 Dryden Rd., Ithaca, N. Y.

Vouchers: S. J. Roberts and C. E. Hayden.

JONES, RUSSELL K., D.V.M.

20 Glenn Rd., Tuckahoe, N. Y.

Vouchers: A. G. Danks and H. J. Milks.

KIEHLE, KENNETH L., D.V.M.

Livonia, N. Y.

Vouchers: H. C. Stephenson and J. N. Frost.

LANGMAN, JAMES H., D.V.M.

Oxford, N. Y.

Vouchers: J. N. Frost and H. C. Stephenson.

LEWIS, GILBERT, D.V.M.175-40 Grand Central Parkway, Jamaica 3,
N. Y.

Vouchers: J. N. Frost and H. C. Stephenson.

LEWIS, RALPH W., D.V.M.

Moers, N. Y.

Vouchers: H. M. Doremus and H. C. Stephen-
son.**LIEBIG, PHILIP H.**, D.V.M.

Granville, N. Y.

Vouchers: H. C. Stephenson and H. J. Milks.

LOPEZ, ROBERT A., D.V.M.

201 Williams St., Ithaca, N. Y.

Vouchers: J. N. Frost and M. G. Fincher.

McMURRAY, HOMER F., D.V.M.

Milford Rd., Nashua, N. H.

Vouchers: H. L. Gilman and F. E. Beaver.

MITCHELL, GRAYSON B., D.V.M.

King Ferry, N. Y.

Vouchers: H. C. Stephenson and H. J. Milks.

MORROW, GORDON G., D.V.M.

309 Stewart Ave., Ithaca, N. Y.

Vouchers: A. G. Danks and H. M. Doremus.

RADCLIFFE, HARRY, D.V.M.

1820 E. 13th St., Brooklyn, N. Y.

Vouchers: J. N. Frost and M. G. Fincher.

RITTER, ANDREW S., D.V.M.

Box 116, Hudson, N. Y.

Vouchers: A. G. Danks and H. C. Stephenson.

SHAFFER, JOSEPH C., D.V.M.

136-45 Hook Creek Dr., Rosedale, L. I., N. Y.

Vouchers: H. C. Stephenson and H. J. Milks.

STEIN, HERMANN B., D.V.M.37 Powerhouse Rd., Roslyn Heights, L. I.,
N. Y.

Vouchers: H. C. Stephenson and H. J. Milks.

WALKER, ROBERT D., D.V.M.
410 Elmwood Ave., Ithaca, N. Y.
Vouchers: J. N. Frost and H. C. Stephenson.

WATSON, JAMES P., D.V.M.
Lakewood, Pa.
Vouchers: H. C. Stephenson and H. J. Milks.

WESTER, RALPH F., D.V.M.
Bristol Rd., Clinton, N. Y.
Vouchers: J. N. Frost and H. C. Stephenson.

WILCOX, HARRISON J. JR., D.V.M.
New York State Veterinary College, Cornell University, Ithaca, N. Y.
Vouchers: H. C. Stephenson and J. N. Frost.

ZELLER, CARLETON M., D.V.M.
228 Lenox Ave., Oneida, N. Y.
Vouchers: H. C. Stephenson and H. J. Milks.

Second Listing

Colorado A. & M. College

Mason, Walter S. Jr., D.V.M., Clinton, Okla.

Texas A. & M. College

Folse, Dean S., D.V.M., 4018 Harrison, Kansas City, Mo.

U. S. GOVERNMENT

Alien Property.—*Index and Guide* to 45,000 patents vested in the Alien Property Custodian enables citizens of the United States to reap some benefit from the war in terms of prewar enemy research amounting to millions of dollars, since a large number of patents and patent applications were seized from enemy aliens and nationals of occupied countries. Licenses under most of them can be obtained for the small administration fee of \$15 per patent. They cover practically every sphere of industrial and professional work, and for convenience they have been broken down into 312 general groupings. Among them is a complete set of 8,000 chemical abstracts available for \$25. Copies of actual patents can be seen at the Custodian's office in Chicago.

Undulant Fever Increasing.—The February (1945) data on the incidence of human brucellosis, published by the U. S. Public Health Service, show 354 cases as compared with 184 for February, 1944. Undulant fever is now a reportable disease in 48 states.

Depot Vets Conduct Inspection of Food is the headline of a two-page, illustrated spread in the Easter issue of *The Log of Columbus*, publication of the army service depot at Columbus, Ohio. *The Log* is published monthly under the supervision of the Public Relations office of the depot. Seven pictures, one of them reproduced on page 330, show veterinary officers and technicians at work in the procurement and sanitary inspection of perishable and nonperishable food for the depot quartermaster. The supervision

extends to packing and dairy plants, and to storage warehouses and installations in metropolitan Columbus and as far as Louisville (Ky.). During 1944, this force inspected an average of 1,800,000 lb. of meat and dairy products monthly for the Army, Navy, Coast Guard, and Marine Corps, and maintained a dispensary service for the pet animals of the command. Says *The Log*: "Inspection standards...are basically hygienic and are established for the maintenance of troop health and adequate nutrition."

The leadership of women in the prosecution of the war is indicated by the editorial personnel of this excellent periodical. The editor is Betty Smoyer, associate editor, Mattie Treman. Among the departmental editors, there are 19 women and 4 men.

New Appointees Head Agricultural Research Administration.—The Agricultural Research Administration, which comprises the Bureau of Animal Industry and seven other agencies of the U. S. Department of Agriculture, is now headed by Mr. P. V. Cardon, former assistant administrator, who was named to succeed Dr. E. C. Auchter who resigned as administrator, effective Feb. 3, 1945. Dr. Auchter had been head of the ARA since it was established by executive order in 1942; he resigned to become director of the Pineapple Research Institute of Hawaii, with headquarters in Honolulu.

To fill the post left vacant by the promotion of Mr. Cardon, Secretary of Agriculture Wickard announced, on March 20, 1945, the appointment as assistant administrator, of Dr. W. V. Lambert, former associate director of the agricultural experiment station at Purdue University.

Mr. Cardon, the new administrator, is a graduate of Utah State College. He is an agronomist and spent ten years in this work with the Bureau of Plant Industry, USDA, beginning in 1910. In 1920, he was professor of agronomy at Montana State College and then joined the staff of Utah State College, where he eventually became director of the agricultural experiment station, a position he held for seven years. In 1935, he returned to the Bureau of Plant Industry in Washington to take charge of the work in forage crops and diseases, and four years later became assistant chief of the Bureau. He was named assistant administrator of Agricultural Research in 1942.

Dr. W. V. Lambert, the new assistant administrator, took up his new duties on April 16. He had had a broad experience in many phases of livestock research, having received his training in animal husbandry and genetics at the University of Nebraska, Kansas State College, and the University of California. From 1923 to 1936, he was an instructor and, later, assistant professor of genetics at Iowa State College and then spent four years with the Bureau of Animal Industry, USDA, in charge of the

livestock breeding program at several of the Department's stations throughout the country. During this time, he also helped to establish the Bankhead-Jones regional research laboratories at Dubois, Idaho (sheep), Ames, Iowa (swine), and East Lansing, Mich. (poultry). In 1940, Dr. Lambert was named associate director of the Purdue University Agricultural Experiment Station, a position he filled until his recent appointment as assistant administrator of ARA.

He is active and well known in many agricultural and livestock fields, is secretary-treasurer of the American Society of Animal Production, and chairman of the Inter-Association Council on Animal Disease and Production, which represents five major associations concerned with livestock and the veterinary service. Dr. Lambert is also secretary of the governing board of the North Central Experiment Station Directors, administrative leader of a cooperative farm structures program in the North Central States, and chairman of a special committee on farm structures of the Land-Grant College Association.

AMONG THE STATES

Arkansas

Vetoes Livestock Bill.—According to the *Arkansas Gazette*, Little Rock, March 6, 1945, the Governor vetoed the bill (H. B. 162) creating a livestock commission of five livestock producers, obviously on the ground that a packer and a veterinarian should have been included. The bill, however, shows an awakening on the part of the state to the bad livestock situation brought about by failure to give the people the benefit of modern husbandry and to protect the nation's livestock against the incubation and spread of costly plagues.

S/FRANK HURLBUT.

California

Southern California.—The Southern California Veterinary Medical Association met jointly with the Small Animal Veterinary Medical Association, April 5, 1945, at the Clark Hotel, Los Angeles. Forty-five members and guests attended. The guest speaker was Dr. M. A. Stewart, who has been appointed head of public health for Bolivia.

The officers for the Association were incorrectly reported in the April issue. They are: Drs. H. C. Utley, *president*; J. E. Wilson, *vice-president*; and C. M. Baxter, *secretary-treasurer*.

S/C. M. BAXTER, *Secretary-Treasurer*.

Penicillin for Research.—Robert G. Sproul, University of California president, announces that the veterinary science division of the College of Agriculture has been given 55,500,000 units of penicillin for research.

Great Veterinary College in the Making.—The *Los Angeles Examiner* of February 19, devotes an illustrated, two column editorial to the College of Veterinary Medicine, University of California, in terms that remove all doubt as to the popularity of the half million dollar



—Reduced from the *Los Angeles Examiner*
"For Man's Best Friends"

appropriation made in 1941 by the state legislature for that project, just before the country was overtaken by Pearl Harbor, and all such projects were stopped throughout the country. As told by the editorial, the college will be conducted within the College of Agriculture, at Davis, but will work in collaboration with the University's School of Medicine and School of Public Health. Quoting Dean C. B. Hutchinson, of the College of Agriculture: "It is the general consensus that there is a great need for another veterinary college on the Pacific Coast and that the University of California is the logical place for it. So far as I can see at the moment, we are facing no obstacle to its development."

Colorado

Junior Veterinary Medical Association.—The chapter at Colorado A. & M. College has elected the following to serve for the winter semester of 1945: William Pitt, *president*; Sidney Allen, *vice-president*; Roger Curtis, *secretary*; and Russel Jourdan, *treasurer*.

District of Columbia

District Association.—The District of Columbia Veterinary Medical Association met Jan. 23, 1945, at the Mayflower Hotel. The technical program included the following:

Dr. D. C. Boughton, Zoölogical Division, Beltsville, Md.: "Coccidiosis of Calves." (Film.)

Dr. Mason Weadon, Washington: "Glaucoma in Dogs and Cats." (Film.)

The officers elected for 1945 are Dr. Gerard Dikmans, *president*; Col. H. K. Moore, *first vice-president*; Dr. Mason Weadon, *second vice-president*; and Dr. Wm. M. Mohler, *secretary-treasurer*.

s/WM. M. MOHLER, *Secretary-Treasurer*.

Florida

Personal.—Dr. Lee N. Borer (Tex., '43), Deland, formerly employed by the Florida State Live Stock Sanitary Board, has accepted a position with the Corpus Christi-Nueces County Health Unit, Corpus Christi, Tex.—Dr. W. C. Halre (A.P.I., '41), employed as veterinary inspector by the Florida State Live Stock Sanitary Board, and located in Trenton and Tampa, resigned in February to enter practice. He is associated with R. W. Applegate, 200 Morgan St., Tampa.—Dr. G. L. Lewallen (A.P.I., '41), formerly in practice with R. W. Applegate, is now associated with his father, G. W. Lewallen (A.P.I., '11), St. Petersburg.

The following veterinarians participated in the Short Course for milk sanitarians at the University of Florida, March 12-15: Drs. J. V. Knapp, A. L. Shealy, D. A. Sanders, H. H. Rothe, and L. A. Scribner. This course was held at the University Dairy Products Laboratory especially for all city, county, and state milk sanitarians.

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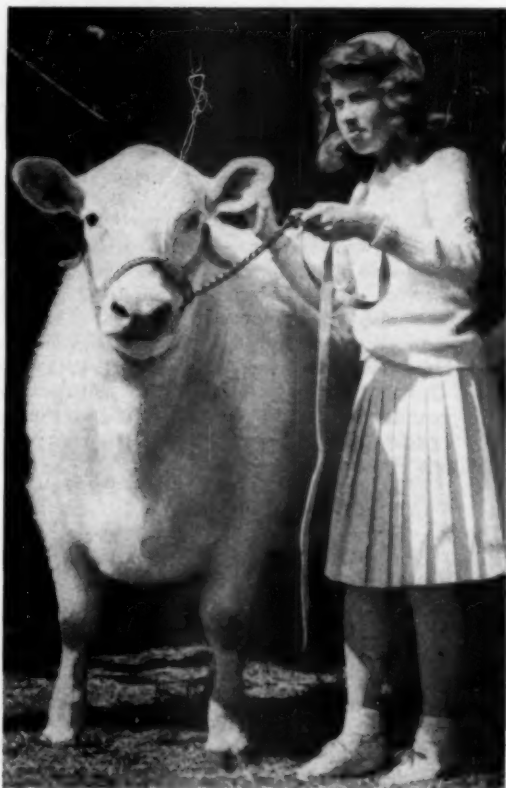
Daughter of Florida Veterinarian Wins Stock Show Honors.—Miss Betty Griffin, 14-year-old daughter of Dr. D. W. Griffin (A.P.I., '24), Chipley, Fla., won the \$25 war bond, annually awarded by the Florida State Veterinary Medical Association to the winner of the showmanship contest at the Fifth Southeastern Fat Stock Show and Sale in Ocala, Feb. 22, 1945. Competing against some fifteen 4H Club and Future Farmers of America members, she demonstrated ability in showing her pure white Polled Shorthorn steer, "Snowball III", raised and fed by her, before the judge, R. S. Glasscock, of the Animal Husbandry Department, of the University of Florida, and a large crowd of interested spectators.

Showing in the four classes in which he was eligible, Betty's steer took 4H Reserve Championship, first place 4H Class A (above 900 lb.), third place in Florida Bred and Fed, and fourth place in the Open Class, to win \$50 prize money. Snowball III weighed 1,075 lb. and was 15 months old when shown. He sold for 53 cents per pound to a Jacksonville store.

This is the third year Miss Griffin has selected a white steer from her father's herd to feed out for this fat cattle show, and each

has surpassed his predecessor. With her training and experience, Miss Griffin can be expected to be a top contender in future shows.

In addition to his practice, Dr. Griffin breeds



pure bred Polled Shorthorns on his "Pine Acres Farm". Though small, the herd carries some of the best shorthorn bloodlines in the world and is headed by two Oakwood bulls bred by Teegardin of Ashville, Ohio. Of the 25 cows and calves, 5 are imported heifers from Perth Champions and 2 calves by Imp. Cruggolton Proud Prince, imported from England in 1943.

Illinois

State Association Survey.—Secretary Hastings is making a state wide survey of the distribution of veterinarians within the state with the object of collecting information desired by new arrivals, by those who may want to change locations, and by practitioners needing assistants. The following questionnaire has been distributed for the purpose:

- 1) How many veterinarians are engaged in full time practice in your county?
- 2) How many are engaged in part time practice?
- 3) What other activities are the above men (question 2) engaged in?

4) Is there an area near you without the services of a licensed graduate veterinarian?

5) Name town wherein an opening exists.

6) Is there an area near you receiving inadequate veterinary service?

If answer to above is yes, name town or village.

7) Do you need a graduate assistant?

8) Do you know of anyone needing an assistant?

9) Who?

Remarks:

s/C. C. HASTINGS, *Secretary-Treasurer*.

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Chicago Association.—The April meeting was held the first instead of the usual second Tuesday of the month in order to avail the Association of the opportunity to hear a lecture on endocrinology by Dr. F. X. Gassner of Colorado State College. The fine reception of Dr. Gassner's treatment of that subject at the annual meeting of the State Association at Springfield in January is recalled in Secretary Young's announcement.

s/W. A. YOUNG, *Secretary-Treasurer*.

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Personal.—Capt. Henry A. Bender (K.S.C., '43) figures in official reports as the officer in charge of a modern blacksmith and veterinary "shop," employing two American soldiers and 115 Chinese workmen. The establishment is in the China theater of operations, located in the Pine Tree Mountains. Captain Bender is from Canton. He served with the Chinese Army at the Battle of the Salween. His shop is described as having great rows of anvils and forges and well-trained workers. The place resembles a hospital more than a blacksmith shop, the release says. Each of its forgers "turns" 100 shoes per day, enough to reshoe a whole Chinese division in two and one-half days. The Captain compliments the Chinese for their craftsmanship. Except for the anvils, they make their own equipment.

Indiana

Northwestern Association.—The Northwestern Indiana Veterinary Medical Association held a dinner session at Nu Joy Restaurant, Kentland, March 29. Legislation affecting the veterinarian was presented in a round-table discussion directed by Dr. C. R. Donham, of Purdue University.

s/N. K. DECKER, *Secretary*.

Iowa

Personal.—From the India-China Division of the Air Transport Command comes word that Daniel P. Dodd (I.S.C., '42), of St. Louis, was promoted to the rank of major. He entered the service in 1942 and is now serving as divi-

sion veterinarian. The ICD flies vital material over the Himalayas and uses pack trains in ultimate delivery.

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Dr. Munce Elected Vice-President of Allied Laboratories.—At the March, 1945, meeting of its board of directors, Dr. T. W. Munce, president of the Sioux City division of the organization, was elected a vice-president of Allied Laboratories, Inc. The office of chairman of the board, occupied by the late James E. Bartlett since the organization of Allied Laboratories, Inc., was left unfilled. All other officers were reelected.

Prior to taking over his duties at Sioux City, Dr. Munce was director of the Pitman-Moore Biological Laboratories, at Zionsville, Ind. He has long been a contributor to scientific literature and has been active in the affairs of a number of veterinary associations and also in Associated Serum Producers, Inc.

On March 19, Allied Laboratories, Inc., announced the appointment of Major Kenneth F. Valentine to be assistant to the president of its Pitman-Moore division.

Major Valentine, who was assistant sales manager of the Pitman-Moore division before entering the armed forces, was recently placed on an inactive status for service in industry rated as critical by WPB.

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Champion Steer.—The bovine prodigy of 1944 is the 1,750 lb. Hereford steer, pronounced grand champion of the Chicago Market Fat Stock Show, wartime substitute for the International Livestock Exposition. He was fed by Benny Greve, a 4-H boy of Bryant, and sold at \$4.50 the pound. The steer was used by the judging classes at Ames in February.—*From Iowa Veterinarian*.

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A Rabid Horse.—Among the casualties of the rabies outbreak in eastern Iowa was a horse reported by Dr. A. H. Stephenson, of Bennett, at the meeting of the East Central Association in December.

Kansas

My Kingdom for a Mule.—Capt. Guilfoil (KSC '39), prominent in the veterinary circle around Kansas City, and former BAI inspector at St. Louis, fought over some of the most rugged terrain in the world, says the Public Relations Officer of the Chinese Combat Command, where veterinary units played an important rôle in making possible the transportation of supplies to the fighting front over dangerous trails of the Kaolikung Mountains.

Good pack mules, because of the constant demand, were hard to obtain. It took a month of travel to buy 65 head. The price was \$23,000 a head (Chinese CN). One mule was bought

for \$45,000, the Captain reports. As much as \$100,000 has been paid for a mule, the equipment costing another \$2,300. One veterinarian



—U. S. Army Signal Corps

Capt. Thomas J. Guilfoil, of Kansas City, Kans., Veterinary Liaison Officer with the Chinese Combat Command, U. S. Army

went all the way to Tibet to buy pack animals. It took five months to buy 1,500 head.

The Captain is a member of the AVMA where his father, W. J. Guilfoil, is recalled as one of the pioneer producers of hog-cholera antiserum.

Louisiana

Veterinary Science Research.—The research group of the Agricultural Experiment Station has published a 6-page multigram on veterinary research in Louisiana that is invaluable as a history of the pioneer veterinary service in the South when, in 1889, W. H. Dalrymple, M.R.C.V.S., was appointed veterinarian of the station. He established the laboratory for investigating diseases of farm animals that was to make a profound impression on the rôle of science in animal production throughout the country. First call was given to anthrax, glanders, tick fever, and bovine tuberculosis, which in the 1880's and '90's were everywhere begging scientific attention. Of indelible record and to the credit of this laboratory, is pioneer work on anthrax sanitation and vaccination, on glanders control, on the life cycle of the cattle tick, on cottonseed poisoning, and other researches which gave the United States its "livestock South." Credit is shared with Entomologist H. A. Morgan, and Drs. S. B. Staples, H. J. Milks, G. Dikmans, T. C. Paulsen, Harry Morris, C. W. Edgerton, W. T. Oglesby, R. L. Mayhew, R. Jensen, M. J. Swenson, G. Hargis, P. L. Piercy, Dennis Sikes, W. C. Schofield, and A. J. Groth, who have carried on since the retirement and passing of Dr. Dalrymple in the early 1920's. These names and the research

projects on the station's work sheet of the present time stand out as a tribute to the pattern of practical research founded by a distinguished past president of the AVMA.—[From "Veterinary Science Research in Louisiana, 1889-1945." Prepared by Veterinary Science Research Department, Louisiana Agricultural Experiment Station.]

Maine

State Association.—The Maine Veterinary Medical Association met at the Worster House, Hallowell, April 11, 1945. The technical program was as follows:

Dr. Gerry B. Schnelle, Angell Memorial Animal Hospital, Boston: "Army Dogs from a Veterinarian's Viewpoint."

Dr. Joseph E. Porter, pathologist, Maine General Hospital, Portland: "Diseases of Human Beings Transmitted from Animals."

s/S. D. MERRILL, Secretary-Treasurer.

Massachusetts

State Association.—The regular monthly meeting of the Massachusetts Veterinary Medical Association for February was well attended and in place of a literary program, the entire meeting was given over to a discussion of problems and trends facing the veterinary profession.

The March meeting of the Association was held at the Hotel Vendome, Boston, March 28, 1945. The technical program was devoted to large animal and small animal subjects, including the following:

Dr. F. M. Austin, president, Massachusetts Veterinary Association, Belchertown: "Bovine Abdominal Surgery." (Film.)

Dr. C. Lawrence Blakely, Boston: "Repair of Diaphragmatic Hernia in the Dog." (Colored film.)

s/H. W. JAKEMAN, Secretary.

Missouri

Complimentary Editorial.—The following is a clipping from the editorial page of the *St. Louis Post Dispatch* of Nov. 6, 1944. The title is "A Proud Record," under which the editor says:

In the matter of animal health we are more fortunate in this country than we are apt to realize, as accomplishments of the past are all but forgotten. J. G. Hardenbergh, secretary of the American Veterinary Medical Association, recounts some of them:

1. Contagious pleuropneumonia, a devastating disease of cattle which only the oldest in the field of veterinary sanitation can recall, was completely eradicated many years ago.

2. Foot-and-mouth disease, still a scourge of livestock in Europe and in

several Latin-American countries, has been eradicated on seven occasions.

3. European fowl pest was eradicated after its single introduction into this country.

4. Cattle fever tick has been eradicated from 99 per cent of the area originally infested.

5. Bovine tuberculosis has been reduced from a national average of 5 per cent (one out of 20 cattle infected) to less than 0.2 per cent (1 out of 500 infected). The most recent figure is 0.18 per cent.

6. Hog cholera losses have been reduced at least two-thirds.

7. Cattle scab (scabies) has been practically eradicated.

8. Sheep scab losses have been reduced more than 90 per cent, being almost eradicated from western ranges.

9. Glanders of horses is almost unknown now, whereas it used to be a common and serious infection.

10. Dourine of horses has been practically eradicated.

11. Bovine brucellosis (Bang's disease), is now being attacked on a nation-wide front and much progress has been made already in reducing losses.

12. Pullorum disease of poultry has been substantially reduced.

The animal disease problems that are still with us, and those that presumably lie ahead, are just as formidable, but the record of the past affords some guaranty of the success of the future, for we have in this country the most competent and resourceful veterinary service in the whole world. It is, obviously, of vital importance that it be maintained. And it can be maintained only if it receives the support of livestock producers, so that young men of ability see in it attractive opportunity.

Montana

State Association.—The thirty-fifth annual meeting of the Montana Veterinary Medical Association was held at Bozeman, March 5-7, 1945. This was the first meeting since 1942. Due to the limited number of members belonging to this association, it was permissible under O.D.T. regulations to hold this meeting. The following technical program was presented:

Dr. H. B. Mills, State College, Bozeman: "Heel-Flies and Cattle Grubs in Montana."

Dr. James Farquharson, Fort Collins, Colo., president of AVMA: "Bovine Surgery" and "Lameness and Other Diseases of Horses."

Dr. B. O. Fisher, Great Falls: "Demonstration of Technique of Intradermal Vaccination for Brucellosis."

Dr. J. W. Safford, Butte: "Demonstration of Autopsy Technique."

Dr. E. A. Tunnick, Bozeman: "Rinderpest," and "My Experiences in China." (Film.)

Pathological Division, BAI, USDA: "Vesicular Diseases of Animals." (Film.)

Dr. Lee Seghetti, Bozeman: "Salmonella Septicemia in Hogs."

Dr. Arne Nordskog, State College, Bozeman: "Effect of Ergotized Barley on Reproduction in Sows."

Drs. G. W. Cronen, inspector-in-charge, BAI; and **W. J. Butler**, state veterinarian, Helena: "Official Disease Control Work."

Dr. W. E. Petersen, University of Minnesota, St. Paul: "Physiology of Lactation with Special Reference to Mastitis."

Dr. J. D. C. Wipf, Livestock Sanitary Board, Bozeman; and **Drs. J. A. Nelson** and **J. O. Tretsven**, State College, Bozeman: "Demonstration of Methods of Production of High Quality Milk."

s/G. W. CRONEN, *Secretary*.

New York

Veterinary Medical Association of New York City Inc.—The regular meeting of the Association was held in the East Room of the Hotel New Yorker, April 4, 1945. The following technical program was presented:

Dr. Otto Stader, past president, American Animal Hospital Association, and inventor of the Stader splint: "Difficult Fracture Problems."

Dr. Fred A. Mettler, Department of Neurology, College of Physicians and Surgeons, N. Y. City: "Neurological Symptoms in Dogs."

s/C. R. SCHROEDER, *Secretary*.

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May Ban Uninspected Mettwurst.—The aftermath of an outbreak of trichinosis involving 32 cases in New York City in eight days recently is the long delayed proposal to demand local inspection of meat products not produced under the supervision of the U. S. Meat Inspection Division. The outbreak was traced to a Bronx processor who had failed to comply with the health department regulations requiring that pork be kept at 5 F. for twenty days.

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DeVine Laboratories Sold.—The sale of the J. F. DeVine Laboratories, Inc., of Goshen, to the Ciba Pharmaceutical Products, Inc., of Summit, N. J., has been announced. The affairs of the laboratories will be conducted under the name of Goshen Laboratories, Inc., a \$500,000 corporation according to the *Middletown (N. Y.) Times Herald*, of February 6.

The laboratory, since the death of Dr. John F. DeVine, in March, 1940, has been conducted by his wife, Mrs. Rose C. DeVine. The new firm will be headquarters for the distribution of Ciba products. C. Guy Stephenson is announced as the general manager.

The transfer recalls the colorful life of Dr. John F. DeVine (Amer., '98), assistant to Roscoe R. Bell, of Brooklyn, who located at Goshen in 1901 where he developed what has been conceded to be the largest rural practice in this country. He retired from practice in 1923 to found the commercial laboratory which he served as president until his tragic death on board ship in the Pacific Ocean while on a vacation.

The New Narcotic Regulations.—The new narcotic regulations, announced by the state commissioner of health, apply only to institutions, jobbers, and manufacturers. Inasmuch as druggists, physicians, dentists, and veterinarians operate under the regulations of the federal Bureau of Narcotics—the Harrison Act—they are exempt.

Vitamin Research Institute.—The Vitamin Research Institute was organized at a meeting held in the Waldorf-Astoria, January 29. Its purpose is to collect and correlate authentic data on vitamins for its members, the medical profession, health authorities, and educational institutions. Forty companies in the vitamin

field participated in forming a prospectus outlining scope of activity, embracing the work of physicians, veterinarians, dentists, and pharmacists.

A New House Organ.—A two-color periodical, named *Dog Research Progress*, is the newest house organ to appear in the veterinarian's field, and the first one to champion a specialized cause within the scope of professional work. It is announced as "a journal of summary and comment published periodically as a service to veterinarians." The editor is Harry Miller, executive secretary of the Gaines Dog Research Center of New York City. Vol. I, No. I, is topographically fine, typographically okay, and technically interesting. *L.A.M.*

North Dakota

Attempt to Abolish Livestock Sanitary Board.—Despite the outstanding achievements of the State Livestock Sanitary Board through the thirty-seven years of its existence, a bill was introduced in the State Senate to abolish it along with the Stallion Registration Board, and the Poultry Improvement Board, and to transfer their functions to the Commissioner of Agri-

New York State Veterinary College

CORNELL UNIVERSITY

Ithaca, New York

Class of February, 1945



Third row (left to right)—R. W. Lewis, J. H. Langman, G. Lewis, W. J. Haifleigh, H. Harmon, G. G. Morrow, H. J. Wilcox, Jr., P. H. Liebig, R. F. Webster, C. M. Zellner, R. A. Lopez, J. P. Watson.

Second row (left to right)—N. W. Bartz, A. Evans, H. Radcliffe, R. D. Walker, R. F. Greer, T. J. Beyer, C. S. Duncan, G. B. Mitchell, J. C. Shaffer, H. F. McMurray, T. J. Lynch, R. K. Jones.

First row (left to right)—L. M. Kraft Gutman, D. R. Drew, M. V. Berrigan, Dean W. A. Hagan, Prof. C. E. Hayden, Prof. J. N. Frost, Prof. H. C. Stephenson, H. B. Stein, A. S. Colvin, and A. S. Ritter.

culture and Labor. Writes Resident Secretary T. O. Brandenburg: "There was literally an avalanche of protests from livestock organizations and breeders of all classes against passage of this Bill." The Ways and Means Committee voted unanimously against the change.

Ohio

Dr. E. M. DeTray, Napoleon, was the "Keep 'em Healthy" guest on the station WLW "Everybody's Farm Hour" broadcast at 11:30, April 14, 1945. He discussed "Brooder Diseases."

Oklahoma

Viable Bovine Monstrosity.—While dicephalous bovine monsters are quite commonly met in bovine obstetrical work, viable ones are extremely rare, according to memory and books.



The bull calf born at Tulsa, and reported under the headline "Where's Ripley?" in the *New York Journal-American*, Jan. 16, 1945, therefore, deserves a place in the literature, for as the picture attests, this dicephalus, now more than 6 months old, is alive and thrifty. It has two sets of horns, eyes, and nasal passages. Fantastic are the middle set of horns. They form a V. The calf was born on D day which we take to mean June 6, 1944.

Ontario

Alumni News Wanted.—Pursuant to the publication of an alumni news section in the *Canadian Journal of Comparative Medicine and Veterinary Science*, W. B. Durrell, B.V.Sc., sent a circular letter to alumni of the Ontario Veterinary College, soliciting contributions to the new department. "Such a news section is worth

while and can be made interesting," the circular pleads.

Rhode Island

Ban Canadian Cattle.—Following an investigation by Mr. Raymond G. Bressler, director of the State Department of Agriculture, and Dr. J. S. Barber, state veterinarian, which took them to Quebec, Ontario, and northern New England, a ban was placed on the importation of Canadian cattle into the state. The investigation involved the clever scheme of switching ear tags from healthy to tuberculous cows, allegedly by Vermont dealers who handled Canadian cattle consigned to them after they had passed the port of entry at St. Albans, Vt. Veterinarians of the U. S. Bureau of Animal Industry cooperated in the investigation, which was instituted when a survey showed that out of 93 cows condemned as tuberculous, 67 of them originated in Canada.—*From the Evening Bulletin, Providence, Jan. 11, 1945.*

S/CHARLES H. CUNNINGHAM.

South Carolina

State Association.—The South Carolina Veterinary Medical Association held its annual business meeting in Columbia, Jan. 15, 1945. After discussing the problems connected with holding a summer meeting, it was decided to leave the matter to the decision of the officers of the Association.

Dr. William A. Barnette, of Greenwood, was renominated as a member of the State Board of Veterinary Examiners for a period of three years and the Association's recommendation was forwarded to the Governor for his approval.

The officers of the Association were elected as follows: Dr. F. P. Caughman, Jr., *president*; Dr. J. G. Gibson, *vice-president*; Dr. R. A. Mays, *secretary-treasurer*.

S/R. A. MAYS, *Secretary*.

Foreign

Belgium

American Food-Supply Service.—The American troops are supplied daily with fresh meats and eggs through carefully maintained refrigeration of foodstuffs in transit. "Reefer" ships come into port (not named) loaded with great cargoes of beef, lamb, shell eggs, and dehydrated rations. The fresh meats are quickly rushed to the troops in waiting refrigerator cars and trucks. Lt. Col. R. S. Wann, of Montgomery, Ala., port veterinarian, and Capt. V. F. VanWagenen, of Fonda, N. Y., assistant port veterinarian of the Veterinary Corps, cooperate with the quartermaster and transportation corps in keeping up a continuous flow of foodstuffs from port to destination. The perishable

food officer is Major H. R. Lancaster of Salt Lake City. The port has a cold storage plant with a capacity of 4,000 tons. The familiar frozen sides of beef of the last war which came wrapped in burlap have been replaced by 50-lb. packages. Another officer engaged in rushing fresh food to the combat units is Capt. C. M. Richter of Newville, Pa.—*From Public Relations Section, Communication Zone, European Theater, March 5, 1945.*

Great Britain

The Rabies Threat.—According to the *Lancet*, quoted by the *Veterinary Record*, the incidence of rabies in dogs is higher in Continental Europe than at the end of the last war when, in 1918, the disease appeared in England for the first time in many years. Since conditions favorable for the reintroduction of the disease are being repeated, the Board of Agriculture has asked the veterinarians to be on their guard for rabid dogs. Hope is expressed that false sentimentalism will not annul the six-months quarantine law which has kept Great Britain the only rabies-free country in the world.

Mexico

Personal.—Dr. Oliver D. Chapman (C. V. C. '15), of New Orleans, La., is now located in Mexico City where he is conducting a practice at the race track. Dr. Chapman advises that he expects to stay in Mexico "until racing opens in the States."

New Zealand

Milk for School Children.—The Dominion Act of 1937, which provides that school children be issued a half pint of pasteurized milk, free of charge, daily, has progressed to the point where 234,000 out of 282,000 drink that quantity of milk along with their regular ration. A "Milk Scheme Officer" is charged with supervising the sanitation of the source, handling, distribution, and the price paid.

Philippines

Beriberi.—The high incidence of beriberi among the American prisoners liberated from the Cabanatuan prison is not without the element of irony. It was Surgeon General Takaki, of the Japanese Navy (in 1884), who was first to prevent and cure that disease by supplying his men with an antiberiberi ration. That was thirteen years (1897) before the Dutch physician Eijkman made the experiments with polished rice that started the chase for the B vitamins. It was also in the Philippines (1910) that the American physician—Dr. R. R. Williams—started studies which led to the synthesis of vitamin B₁ (= thiamin).

Army Needs Horses.—Yanks in Luzon are scouring the countryside for horses for use in

operations over rugged mountainous country. The small Philippine ponies are not strong enough for the purpose. Former U. S. Army horses, captured by the Japs in 1942, are being gathered up, rehabilitated, rigged for service, and assigned to the cowboys, ranchers, and farm boys among the troops. The source of the report is the 33rd Division, formerly made up mainly of Illinois national guards.

Russia

American Muskrats.—The several hundred muskrats imported from the United States before the war, and used to establish muskrat farms in Siberia, are now furnishing many thousands of skins annually.—*Science News Letter.*

Venezuela

The Incidence of Plague.—Since 1939-1940, when 11 cases with 8 deaths occurred in one district, there has been no bubonic plague in Venezuela, and the affected region has been carefully watched for rodent plague. The plagued district is thinly settled and its rodents are mostly wild *Mus rattus* with *Mus (rattus) alexandrinus* occasionally among them. Of 396 fleas examined, 97.2 per cent were *Rhopalopsyllus*, spp. In the absence of other genera, species of this genus were probably the vectors of rodent plague in the region.—*Abstract. Rev. Applied Entomol.*, 32, (Dec. 1944): 229.

Yellow Fever.—Yellow fever occurs only sporadically in Venezuela, and blood samples taken from children 10 to 15 years old in 1941 had an immunity index of 13.6 per cent. No typical cases in the cities bordering the endemic zone have occurred for many years, although *Aedes aegypti* is plentiful.—*Abstract. Rev. Applied Entomol.*, 32, (Dec. 1944): 229.

DEATHS

C. W. Barnhart (K.C.V.C., '01), 66, Wichita, Kan., died Feb. 25, 1945. Dr. Barnhart had been in the federal service as a BAI meat inspector but retired from the Bureau about two years ago and took up practice. He had been a member of the AVMA since 1917.

A. W. Lange (C.V.C., '12), 54, Milwaukee, Wis., died March 4, 1945. At the time of his death, Dr. Lange maintained two small animal hospitals in Milwaukee. He was admitted to the AVMA in 1916 and was a member of the Wisconsin and Southeastern Veterinary Medical Association as well as the American Animal Hospital Association.

Ernest C. Wuest (St. Jos., '14), Platte City, Mo., died Jan. 2, 1945. Dr. Wuest was admitted to the AVMA in 1942.

VETERINARY PROFESSION AND THE WAR

Veterinary Officers Retired

Presented herewith are brief service records of six Veterinary Corps officers, of the Regular Army, who have completed their terms of service and have been retired since the outbreak of the present war, and of one officer who will be retired next September.

The following service data on these Veterinary Corps officers were supplied by the Veterinary Division of The Surgeon General's office.

Colonel Daniel B. Leininger was born Nov. 27, 1879, in Wernersville, Pa. He received his degree of D.V.S. from Kansas City Veterinary College in 1906, and entered the Army as veterinarian with the 12th Cavalry on Sept. 25, 1911. He was on duty with the 7th Cavalry, Camp Stewart, Texas, when he accepted a commission as assistant veterinarian with the rank of first lieutenant on April 4, 1917, under the Act of June 3, 1916. He was promoted through the grades, attaining the rank of colonel on Sept. 29, 1937. Colonel Leininger served as instructor at the Mounted Service School, Fort Riley, Kans. He was a graduate of the Army Veterinary School in 1920, a post-graduate course in 1936. Colonel Leininger served a tour of duty in the Philippines and also at Camp Harry J. Jones, Ariz.; Camp Marfa, Texas; Presidio of Monterey, Calif.; Fort Sill, Okla.; and Fort Bliss, Texas. He was on duty at Fort Ord, Calif., at the time of his retirement on June 30, 1943.

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Colonel Mott Ramsey was born Dec. 31, 1887, at Mongaup Valley, N. Y. He received his degree of D.V.M. from McKillip Veterinary College, Chicago, Ill., in 1916. Colonel Ramsey served as veterinarian with the quartermaster corps from July 1, 1916 to June 30, 1917. He was commissioned a 2d lieutenant in the Veterinary Reserve on June 30, 1917, and called to active duty July 22, 1917. He was appointed a 1st lieutenant, Veterinary Corps, Regular Army, July 1, 1920, attaining the grade of colonel on July 11, 1942. He was a graduate of the Army Veterinary School, class of 1922. A large part of Colonel Ramsey's service was at Fort Sam Houston, Texas, having served three tours of duty at that station. He also served at the Chicago Quartermaster Depot and at Jefferson Barracks, Mo. In 1923, Colonel Ramsey was assigned to a tour of duty in the Philippines. He was again on duty in the Philippines in 1941, and, at the time of the surrender of Corregidor, was evacuated to Australia and later to the United States. He was retired for

disability incident to this service on Dec. 31, 1943.

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Colonel Robert J. Foster was born on Sept. 27, 1880, at Youngstown, Ohio. He received his degree of D.V.M. from Cornell University in 1902, and entered the federal service as veterinarian with the 12th Cavalry on August 30, 1905. He was on duty with the 9th Cavalry in the Philippines when he accepted a commission as assistant veterinarian with rank of 1st lieutenant on May 8, 1917, under the Act of June 3, 1916. He was promoted through the grades, attaining the grade of colonel on Aug. 30, 1931. Colonel Foster returned from the Philippines in 1918 and was assigned to duty in the Veterinary Division of The Surgeon General's office. In 1920, he was sent to Germany for duty as Chief Veterinarian, Army Forces in Germany. He returned to the United States June 30, 1922, and was assigned to the Cavalry School at Fort Riley, Kans., in charge of veterinary instruction. In 1926, Colonel Foster went to Panama for a tour of duty, and upon completion of this duty was assigned to Fort Omaha, Nebr., and later to Fort Bliss, Texas. On May 3, 1934, Colonel Foster again returned to The Surgeon General's Office for duty as Chief of the Veterinary Division. He was serving as service command veterinarian on the Ninth Service Command, with station at Presidio of San Francisco, Calif., at the time of his retirement on Sept. 30, 1944.

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Major John K. Allen was born on Nov. 25, 1910, in Marengo, Iowa. He received his degree of D.V.M. from Iowa State College in 1934. Major Allen was commissioned a 1st lieutenant in the Veterinary Corps, Regular Army, on Oct. 29, 1937, promoted to the rank of captain March 15, 1939, and to the temporary rank of major Dec. 28, 1942. Prior to receiving his commission in the Regular Army, he was on duty with the Civilian Conservation Corps. Major Allen served at Fort Bragg, N. C., Fort Myer, Va., and in Bermuda. Upon his return from Bermuda, he was assigned to Fort Riley, Kans. In 1944, Major Allen was assigned to the China-Burma-India Theater. Shortly after his arrival overseas, he was hospitalized and returned to the United States because of physical disability. He was retired on Jan. 11, 1945.

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Colonel George H. Koon was born Jan. 7, 1881, at Sodus Point, N. Y. He received his degree of D.V.M., from George Washington University in 1911. He entered the service as

veterinarian with the 10th Cavalry on Sept. 27, 1911, and was transferred to the 7th Cavalry in 1914. Upon the organization of the Veterinary Corps June 3, 1916, he was commissioned a 1st lieutenant, attaining the grade of colonel on Sept. 27, 1937. During World War I, Colonel Koon accompanied the 32nd Division overseas. Upon his return from overseas, Colonel Koon was assigned to duty in the Veterinary Division, Office of The Surgeon General, Washington, D. C. Upon completion of this duty, he was assigned to Carlisle Barracks, Pa. He is a graduate of the Command and General Staff School, class of 1927, and later served as station veterinarian at Fort Leavenworth, Kans. In addition to a tour of duty in the Philippines, Colonel Koon served as corps area veterinarian for the Eighth Corps Area and service command veterinarian, First Service Command; he was director of the Army Veterinary School from Aug. 1929 to Nov. 1931. He was on duty at Los Angeles, Calif., at the time of his retirement on Jan. 31, 1945.

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Lt. Colonel Charles S. Greer was born on Nov. 29, 1901, at Murrysville, Pa. He received his degree of D.V.M. from Iowa State College in 1926 and entered the Army as 2d lieutenant on Oct. 7, 1927, reaching his majority on Oct. 10, 1939. He was promoted to the temporary rank of lieutenant colonel on June 12, 1942. Colonel Greer is a graduate of the Army Veterinary School and the Medical Field Service School, and pursued a course of instruction in animal breeding at the University of Kentucky, Lexington, Ky. His first station assignment was Fort Bliss, Texas. After a tour of duty in Hawaii, he served at Fort Robinson, Nebr., Fort Riley, Kans., and Fort Leavenworth, Kans. In July, 1940, Colonel Greer was assigned to duty in the Veterinary Division, Office of The Surgeon General, Washington, D. C. Upon his relief from this duty, he was assigned to the Reno Quartermaster Depot (Remount), Fort Reno, Okla. He was on duty at the Pomona Quartermaster Depot (Remount), Pomona, Calif., at the time of his retirement on Jan. 31, 1945.

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Colonel William H. Houston was born on Sept. 30, 1881, at St. Louis, Mo. He received his degree of D.V.M. from the U. S. College of Veterinary Surgeons, Washington, D. C., in 1917. He served an enlistment in the Navy from 1901 to 1905. Colonel Houston was commissioned a 2d lieutenant in the Veterinary Reserve Corps on June 1, 1917, and was ordered to active duty June 26, 1917. He was appointed captain in the Veterinary Corps, Regular Army, Nov. 27, 1920, attaining the grade of colonel on Nov. 27, 1939. He graduated from the Army Veterinary School, class of 1921, and served as attending veterinarian and assistant to attending veterinarian, Washington, D. C., from 1922 to 1925, when he was transferred to Fort Reno, Okla. He also served a tour of duty in Hawaii and the Philippines. Upon his return from the Philippines in 1936, he was assigned as corps area veterinarian, Fifth Corps Area. He was on duty at Headquarters Fourth Service Command as service command veterinarian from

Sept. 1940 to April 30, 1945, at which time he entered upon terminal leave and will be retired on Sept. 30, 1945.

Awards to Veterinary Corps Officers

Lt. Col. William E. Jennings.—The Bronze Star Medal was awarded on Dec. 24, 1944, to Lieutenant Colonel Jennings (then Major), V.C., AUS, by the Commanding General, United States Forces, China Theater, for "exceptionally meritorious service during the period of 9 June 1943 to 31 December 1943." Lieutenant Colonel Jennings received his veterinary degree from Cornell University in 1931, and has served in the Army Veterinary Corps most of the time since graduation.

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Captain Milton Horowitz.—The Bronze Star Medal was awarded to Captain Horowitz, V.C., AUS, on Feb. 12, 1945, by the Commanding General, United States Forces, China Theater, for "meritorious services during the period 1 January 1944 to 1 November 1944." Captain Horowitz graduated from Michigan State College in 1940. His home was in Elizabeth, N. J., and he was located in Maryland and Tennessee for a time before entering service.

Occupational Guidance Leaflets on Veterinary Medicine

The greatly increased interest in veterinary medicine as a career, brought about by the war, has resulted in numerous requests from service men and others for information concerning accredited schools, entrance requirements, curriculums, and the work of the veterinary profession. The AVMA office in recent months has assisted in revising some of the occupational briefs which are published by guidance services.

The March issue of *Vocational Trends*, a publication of Science Research Associates, Chicago, Ill., features "Doctors of Veterinary Medicine" with a front-cover picture and a two-page article on the qualifications for, the training of, and the opportunities in, the veterinary profession. This organization also publishes a civilian vocational information kit containing 240 occupational and guidance leaflets which is sold to high schools and colleges for use by teachers and vocational counselors. The kit is patterned after the Army vocational information kit which Science Research Associates produced for the War Department. Other guidance leaflets which may be recommended include:

Veterinary Medicine, by W. J. Greenleaf, specialist in occupational information and guidance, U. S. Office of Education. Leaflet No. 18 (revised 1940). Government Printing Office, Washington, D. C. Pp. 15. Price 5 cents.

The Occupation of the Veterinarian, Occupational Index, Inc., New York University, 80

Washington Square East, New York City. Pp. 10. 1938 edition, single copy price, 25 cents; ten or more copies, 15 cents each.

Veterinary Medicine, Western Personnel Service, Pasadena, Calif. 1937. Pp. 4. Price 5 cents.

Veterinary Medicine as a Career, Institute for Research, Chicago, Ill. 1936. Pp. 18. Price 75 cents.

"Okayed for Eatin' "

"Let's get something straight, now," says *The Flying V*, Love Field, Texas. "The next time someone mentions the station veterinarian as being Capt. W. C. Hirschey, we don't want to hear the usual run of sharp remarks . . . A veterinarian? I don't see any mules. . . . This is an Air Force."



—From *Flying V*, Love Field, Texas
Okayed for Eatin'—Captain W. C. Hirschey, Love Field veterinarian, casts an experienced eye as a member of his staff, Corporal Donald Haines, smacks an "OK" stamp on a rump roast squarely on the er. . . rump. This routine food inspection is only one of the many duties performed by the station vet.

The reporter then goes on to remind the personnel of the station that the Captain, graduate of Michigan State College, is doing many things not related to *Equus asinus* of military fame, what with the war dogs and other dogs of the Air Force and the checking and re-checking of the station's food (meat, milk, butter, ice cream, eggs) which arrives in carload lots. "Every pint of milk and spoonful of ice cream" get the attention of the Captain and his

staff, and in closing a good story about what the Veterinary Corps does at an army post the raconteur adds, "And remember, you don't have to have mules to have a veterinarian." We reprint the original caption.

Veterinary Officers in Chicago Organize Monthly Conference

The first meeting of Army Veterinary Corps officers stationed in Chicago was held March 22, at the Chicago Quartermaster Depot, to organize and plan a program of scheduled meetings. A preliminary survey indicated many of the local officers were interested in a program of an educational and scientific nature. The general plan of the conference is to present subjects of interest to the rank and file of veterinary officers on the problems of disease, prevention, control, and treatment. The meetings are sponsored and presided over by Colonel Fred C. Waters, U. S. Army, Depot Veterinarian.

The first regular monthly conference of these officers was held April 5, at the Depot. Executive Secretary John G. Hardenbergh addressed the meeting and answered invited questions on the organization, functions, and objectives of the AVMA. Information on postwar plans and related conditions was presented.



—From *The Log of Columbus*
Major R. T. Gilyard, depot veterinarian, Chief Clerk Gerry Bennett, and technicians of the Veterinary Corps inspecting cuts of meat. Mrs. Gerry Bennett is the wife of Sgt. P. G. Bennett who was recently liberated from the German Prison Camp Stalag III C, by the Russians.



Protect my children against cholera with CUTTER B-T-V—the safer vaccinating procedure

"Frankly," confides this solemn sow, "I've had such trouble raising my children that my husband thinks I'm kind of a Typhoid Mary, or that I don't know how to direct their feeding after weaning, or something!"

"A neighbor told me, through the fence, that she used to have the same trouble. But since her veterinarian started using Cutter B-T-V on her youngsters she hasn't had a bit of trouble with reactions or having them go off feed; that every one reaches market (whatever that is) bigger and faster."

You, too, can be a hero to similar sad-faced sows . . . and their owners.

Shift to B-T-V! Cutter B-T-V contains no

living virus . . . can't cause systemic reactions; doesn't require cutting down on feed. More pigs reach market . . . and quicker!

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An' Related Topics

Future Refrigeration of Food on the Farm



—Courtesy of International Harvester Company

Complimentary and complementary to the initiative taken by the AVMA in respect to revolutionizing food hygiene, particularly of poultry, the International Harvester Company graciously supplies these two depictions of the coming refrigeration and freezing of food on the American farm, the sphere of human endeavor for which it has furnished up-to-the-minute equipment since beyond the memory of living men.

Concentrating its attention, initially, on refrigeration for farms, the Company will offer a line of Zero Chests for freezing and storing perishable food, and another line combining both zero-temperature and ordinary-temperature refrigeration in the same chest. Both are in the pre-production stage.

The Pig Goal for 1945-1946

Hogs of 200 to 270 pounds are to be protected with a support price of \$12.50 per cwt. until March 31, 1946, according to an announcement of the War Food Administration of Jan. 5, 1945. The goal set for the spring pig crop is 57,500,000, the imperative war need. We shall need more hogs and winter, the WFA asserts.

"What do you veterinarians do?" should be easy to answer since all we have to do is to keep the United States from bogging down to the level of a fourth rate nation.

The cold facts about man's dependence upon his lowly domestic animals are yet to be told in understandable terms.

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EQUINE ENCEPHALOMYELITIS

was at least 300% more prevalent in 1944 than in 1943, indicating that it is again increasing and may assume panzootic proportions in 1945.

Publicity

For the fourth consecutive year we are engaging in a widespread publicity campaign through farm papers emphasizing the danger from this disease in 1945 and the importance of preseasonal immunization by veterinarians. This publicity appears in the following farm papers having coverage from Ohio to the Pacific Coast:

Weekly Kansas City Star
Prairie Farmer
Wisconsin Agriculturist
The Farmer
Wallace's Farmer
Dakota Farmer
Western Farm Life
Nebraska Farmer
Texas Farm and Ranch
Pacific Rural Press

Our 1945 Encephalomyelitis Vaccine is now being distributed, and adequate supplies are available either direct or through reputable jobbers throughout the United States.

Cards suitable for mailing to horse owners will be furnished free upon request. These cards are particularly applicable to 1945 needs.

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Original, patented, distinctive D-C-M contains in each 500 cc. vial a full 18.5% of Calcium Borogluconate, 6.5% Magnesium Gluconate, and 18% Dextrose, with traces of Phosphorus.

When treating milk fever cases, it costs no more to specify D-C-M as insurance against concurrent ketosis and tetany... and, less relapses when using D-C-M.

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